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THE QUALITY OF LIFE CONCEPT: A POTENTIAL NEW TOOL FOR DECISION-MAKERS

Booz, Allen Public Administration Services, Inc.

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The Environmental Studies Division, Office of Research and Development, Environmental Protection Agency is making an effort to improve the tools available to decision makers who are necessarily involved in "quality of life" delivery systems. This effort included the sponsorship of a symposium on the subject "The Quality of Life Concept--A Potential New Tool for Decision Makers." The symposium was held at Airlie House in Warrenton, Virginia, on August 29-31, 1972. The objectives of the symposium were to explore the "Quality of Life" (QOL) concept, to define QOL in terms of ~~its~~ components, and to develop suggested quantitative approaches to its use in guiding public policy. The results of this symposium and an elaboration of the issues raised at that time are summarized in Section I of this volume. Section II of this volume is a reviewed version of an anthology first published in preparation for the Airlie House symposium participants.

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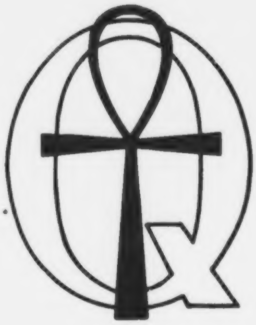

THE QUALITY OF LIFE CONCEPT

A POTENTIAL NEW TOOL FOR DECISION-MAKERS

The
Environmental Protection Agency
Office of Research and Monitoring
Environmental Studies Division

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FOREWORD

The concept of *Quality of Life* has emerged in the last few years as an undefinable measure of society's determination and desire to improve or at least not permit a further degradation of its condition. Despite its current undefinability, it represents a yearning of people for something which they feel they have lost or are losing, or have been denied, and which to some extent they wish to regain or acquire. It is at that point, however, that difficulty arises. *Quality of Life* is a very personal expression of one's sense of well being. In a very real sense it expresses that set of "things" which when taken in the aggregate, makes the individual happy. Yet, it is also probably true that if asked to express the details of this aggregate an individual would provide a somewhat different set each time he is queried. By no means does this suggest that it is hopeless to attempt to describe the concept of *Quality of Life* in a manner that has some meaning within the decision-matrix associated with comprehensive planning of societal actions. Rather, it implies that considerable effort is required to disentangle the *Quality of Life* concept to the point where it has decision making relevance.

It is to this end that the subject symposium was convened. Its purpose was essentially three-fold. First, a group was invited that provided a cross section of the interested community. These ranged from the national to the local, from the private to the public, and from the organized to the individual. The hope was that such a cross section could shed some light on the richness and possible gross ordering of the *Quality of Life* indicators. In the process it was hoped that there might possibly emerge a sub-set of indicators with substantial commonality and that this commonality would be sufficient to destroy the notion that a population of 200 million people would, of necessity, provide 200 million different expressions of *Quality of Life*. Second, it was the hope that out of this symposium would come some sense of whether a potential mechanism exists for systematically incorporating the inputs of the public into the decision making processes that affect the quality of their lives. Finally, it was felt that, at the very least, one could expect such a conference to provide a sense of what additional research is needed in this area.

Many people worked long and hard to produce this symposium and adequately report its results. It was the creature of the Environmental Studies Division of the Office of Research and Monitoring. John Gerba of this Division and Edward Bartholomew of Booz-Allen Public Administration Services, Inc., who brought symposium program and participants together, and Robert Livingston of the Division, who structured the *QOL* exercises at the conference, were instrumental in producing this report. Alan Neuchatz, Patricia Kolojeski, Albert Pines and Kathryn Cousins also assisted in innumerable ways.

How well this conference succeeded in accomplishing any of its objectives can be partially judged by this report. In the final analysis, however, its major accomplishment may be in what each individual carried away at its conclusion, and the forces it set in motion.

March 1973

Stanley M. Greenfield
Assistant Administrator for Research and Monitoring
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THE *QOL* CONCEPT
SYMPOSIUM PLANNING GROUP

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Section 1

"QOL" Debate

Issues Raised at Airlie Symposium

PREFACE

Major programs have been launched the past several decades to improve the *quality of life* of Americans. A massive commitment of funds has been made in the name of that goal. Daily, governmental decision makers are establishing policy and programs, and allocating resources in ways that significantly impact the *quality of life* of different groups of people in different ways.

The Environmental Studies Division, Office of Research and Monitoring, Environmental Protection Agency is making an effort to improve the tools available to decision makers who are necessarily involved in "*quality of life*" delivery systems. This effort included the sponsorship of a symposium on the subject "The *Quality of Life* Concept–A Potential New Tool for Decision Makers." The symposium was held at Airlie House in Warrenton, Virginia, on August 29-31, 1972. The objectives of the symposium were to explore the *"Quality of Life" (QOL)* concept, to define *QOL* in terms of its components, and to develop suggested quantitative approaches to its use in guiding public policy. The results of this symposium and an elaboration of the issues raised at that time are summarized in Section I of this volume.

Section II of this volume is a revised version of an anthology first published in preparation for the Airlie House symposium participants. This present anthology was assembled to give some background perspectives for the consideration of the general reader. The selected readings deal with the *QOL* concept in general as well as from the more specific perspectives of different disciplines–environmental, economic, social, and psychological. The articles represent varying approaches and levels of consideration and were selected to broaden the reader's exposure to the *QOL* concept rather than as a definitive review of the literature in the field. The articles in no way represent the views of EPA.

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THE *QUALITY OF LIFE* CONCEPT

A SYMPOSIUM WRAPUP

CHAPTER I

INTRODUCTION: AN OVERVIEW

Quality-of-Life–QOL–is a new name for an old notion. In the context of this document it refers to the well-being of people–primarily in groups but also as individuals–as well as to the "well-being" of the environment in which these people live.

This chapter, as those which follow, draws upon the presentations, discussions, and circulated papers of the August 1972 Symposium sponsored by the Environmental Protection Agency, on "The *Quality-of-Life* Concept–A Potential New Tool for Decision Makers."

This report is not meant to be the definitive work on the subject nor does it present the "final" answers. Rather, it points forward, focusing on the key issues of the debate, spotlighting the questions that have been raised, and sifting through some of the available alternatives as known to us today.

The National Environmental Policy Act mandates the Federal Government to take action:

> "...in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life."

> The Act declares a policy:

> "to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."

Quality of life means different things to different people. It can be stated that at the present no consensus exists as to what it is or what it means. Many definitions have been attempted–both theoretical and empirical. Yet a consensus *does* exist regarding the importance of the *QOL* concept, the need to define it, and its significance as a potential new management tool.

A number of key questions have been raised. How does one apply values, order, and weights to such things as people, institutions, and the environment? How does one achieve improvement in the quality of people's lives within the context of finite resources? What are the trade-offs–the benefits and costs? Who is responsible for improving the quality of people's lives? What combination of federal, state and local government interaction is required? What is required of individual citizens?

1. THE *QUALITY OF LIFE* IN THE UNITED STATES HAS BECOME THE SUBJECT OF GROWING CONCERN

The preamble to the Constitution includes as one statement of purpose "to...promote the general welfare." This has been the constitutional base for recent social legislation. But no indicators or definitions of the "general welfare" were provided by the founding fathers. The only provision for quantification was that of the dicentennial census, called for in Article 1 of the Constitution.

Nevertheless, the United States is the only country to acknowledge constitutionally the importance of gathered information. This is the first instance of a nation establishing a guide for its destiny at the very moment of declaring the civil and political rights of its citizens (Lear, 1972).

When Schopenhauer cynically stated that there are only two sources of human unhappiness–"not having what you want and having what you want"–he may have been alluding to the dilemma of quantity versus quality. The aspirations of the past for quantities of things are rapidly giving way to a rising concern for quality in life. This shift is precipitating new attempts by individuals and by government to ascertain just what will bring a sense of well-being to people.

People today are increasingly aware of significant changes going on around them. Sheldon and Moore (1968:3) state that the "growth and urbanization of the population, the rising technicality and bureaucratization of work, the general upgrading in standards of living, the spread and increasingly higher attainment levels of education, and the heightened self-awareness and rise of minority groups have created serious social strains."

A question of central concern to the citizen and to the government is made more acute by this rapid modern change: how can we know where we have been, where we are now, and where we are going? Although this is not a new question, the consequences of the answers may be.

Past ways of analysis no longer seem adequate. As Gross and Springer (1967:209) have put it: "Executive officials and members of Congress alike are misled by inadequate interpretation of bad information based on obsolete concepts and inadequate research and collected by underfed and overlobbied statistical agencies." The search for *quality of life* indicators is an attempt to gather new information that would be useful to evaluate the past, guide the action of the present,and plan for the future.

As it now stands, the United States "has no comprehensive set of statistics reflecting social progress or retrogression" (National Goals Research Staff, 1970). No procedure currently exists for taking the temperature of the nation's health.

In our nation of rising and unprecedented affluence, social discontent runs deep and as yet unmeasured. The vague areas of dissatisfaction form the heart of the problem known as the "*quality of life*" question. A new emphasis on that which is beyond "just economics" is developing which underscores the concern for the natural environment, concern about pollution, health, over-crowding, cultural opportunities, and political influence. These are the concerns of the new discussions about "*quality of life" (Report of the White House Conference on Youth*, 1971:71-74).

2. NO CONSENSUS EXISTS REGARDING *QOL* DEFINITION

Most people approach *QOL* with widely varying preconceived "definitions." Some definitions deal with such seemingly "non-measurables" as love, affection, status, happiness, and other subjective feelings. Although in Chapter IV we will deal with measurement in more detail, it is worth noting at this stage that the tools are not yet available which will enable one to confidently do such things as: quantify work satisfaction; set a value on leisure time; relate both work and leisure to such debates as growth vs. non-growth; and then relate it all to the environment.

Each individual, organization, agency, and group has its own idea as to what kind of clock might be placed beside the population clock for the purpose of counting human well-being. People tend to alter their viewpoints depending upon what role they are playing and in what group. A person may be responding as a parent, a subordinate or a supervisor at work, a citizen in the voting booth, or an attendee at an ethnic dinner and will make decisions regarding what, in a given situation, will enhance his well-being.

QOL is seen differently by people of different life styles (youth, racial minorities, women, men, aged, WASPS). People with different academic and cultural backgrounds likewise approach it differently. For some *QOL* means being free to make decisions; for others it is having the security of others making tough decisions for them.

3. SOME DEFINITIONS OF *QOL*, HOWEVER, HAVE BEEN ATTEMPTED

Many attempts at defining *QOL* have been made. In addition, numerous criteria for a definition of *QOL* have been advanced (Schmaltz, et al, 1972:I-3). These include:

- The notion that *quality of life* refers to an indefinite number of states and does not imply an evaluation of life styles

- The idea that there are as many different life states as there are individuals (i.e., there is no single, universal *quality of life* criteria extant in any society at any given time)

- The proposition that *quality of life* refers to a subjective state of the individual and can only be partially explained by using such terms as "trained," "happiness," "educated," "welfare," "self-fulfilled," "satisfied," "reason," "purpose," etc. The same holds true of their opposites: "discontent," "illiterate," "frustrated," "apathetic," "alienated," etc.

These criteria suggest that one may proceed simplistically at the risk of considerable peril. When we look at the rising divorce rate, how do we weigh the good and the bad when we consider the negative effects of a family staying together in a continual state of conflict? Also, in defining *QOL* as well as in attempting to measure it, how influential or skewed are the results, when data typification, collection, and evaluation are based on a given value standard: i.e., that inside plumbing will improve people's well-being, that higher education is a ticket to the good life, etc.

QOL definitions are generally of three types:

- Precise definitions of what constitutes *QOL*

- Lists of components or factors of *QOL* without weights

- Indirect definitions through definitions of social indicators (historically, a common way of "defining" *QOL*)

Nordhaus (James, 1972) suggests a "MEW" index, a measure of economic welfare. It includes defense spending, police and sanitation, services, road maintenance (GNP items), and the value of time devoted to leisure, pollution, urbanization, congestion, and crime (non-GNP items). All of these are based on their costs, on an objective basis.

Hornback and Shaw (1972) focused on the definition and measurement of *QOL* as "a function of the *objective conditions* appropriate to a selected population and the *subjective attitude* toward those conditions held by persons in that population."

The Report of the White House Conference on Youth (1971:71-74) calls for the development of criteria for measurement that will fit both individuals and the general society. It lists 10 areas of social and individual concern it believes should be considered. These include: the natural environment (preservation of natural beauty and wildlife); the living environment (overall maintenance of urban, suburban, and rural living and working areas...clean air and water...building and street aesthetics); income and basic economic security (guaranteed living standard, equitable distribution of wealth); training, education, and culture (opportunity to learn usable skills, problem solving abilities and the value of the world); and individualism (opportunity for free expression and selection of "life style," and levels of social tolerance and alienation), among others.

Singer (1971) looks at *QOL* in part, economically, stating that *QOL* will diminish with the rising costs of such disamenities as pollution and traffic snarls. He goes on to state that as most people perceive happiness in terms of material comforts, a loose *QOL* definition might be "having as much money as possible left over after taking care of basic necessities, and having the necessary time and opportunities for spending it in a pleasant way." This also means "having a maximum range of choices for a way of life."

Perloff (1969) contributes an understanding of measurement concepts in terms of "indicators" and "accounts" as aspects of a *QOL* definition. He notes that "indicators" are "normally used to describe the condition of a single element, factor, or the like, which is part of a complex interrelated system" (employment, cost of living, production, etc.). He refers to "accounts" as "comprehensive systems of data characterized by a balance between inputs and outputs or inflows and outflows...or providing the value of the total stock of various items in a total system." He feels that we have a long way to go before a comprehensive social accounts system for the environment will be feasible. He suggests that, because of the various interrelations and tradeoffs in developing such an overall indicator of environmental quality, the concept of net social benefit (the total or incremental social benefit less social cost) should be developed.

Atkinson and Robinson (1969) talk in terms of "amenities": a cluster of variables whose importance increases as more and more people cluster together in urban regions. For the public interest and the interest of the natural environment, they state that the urban environment must be treated and managed as a system with certain inputs and outputs. They provide a survey of a number of definitions of amenities:

- Catherine Bauer Wurster (1960:225-47) includes New England village, Gold Rush town, historic or merely rustic flavor, open space recreational use, clean air, and water.

- Jean Gottmann (1966:163-78) includes "physical and cultural" components related to the "good life"; attractive, climatologically pleasant surroundings, Riviera-type environments, good landscaping, and urban beauty.

- John Burchard includes urban beauty elements: weather and sky, lakes, river banks, parks, and squares (1965). He also ranks various cities of the world in terms of an "urban amenity score sheet," based on 24 qualitative characteristics, which include trees and shrubbery, generally pleasant climate, distinguished buildings, distinguished museums, visible past, art in the streets, etc. (1968).

- Jon Alexander (1968:55) says that amenities are "those things beyond life's necessities which make human life meaningful...Their function is the development of that in us which is uniquely human."

- Perloff and Wingo (1964) link the notion of amenities with economic development and population growth, viewing the concept in terms of a special constellation of environmental conditions that "affords conditions of the life highly sought after in an affluent and mobile society."

- Sir William Holford (Mandelker, 1962:32) states "amenity is not a single quality, it is a whole catalogue of values. It includes the beauty that an artist sees and an architect designs for; it is the pleasant and familiar scene that history has evolved; in certain circumstances it is even utility–the right thing in the right place–shelter, warmth, light, clean air, domestic service...and comfort stations."

- Gunnar Myrdal has called for "uniform standards in regard to all community amemities," which he defines as everything from "the provision of streets, parks, and playgrounds and their upkeep to the building of schools and the improvements of the level of teaching."

- Webster's dictionary provides the broadest definition of the term and by so doing underscores the problem of trying to quantify such qualitative components. It also sets the stage for our later discussion of microlevel and macrolevel measurement. Webster includes in the definition of "amenities" the following: "the quality of being pleasant or agreeable...the attractiveness and aesthetic or nonmonetary value of real estate...something that conduces to physical or material comfort or convenience or to a pleasant or agreeable life...an area or location that provides comforts, conveniences, or attractive surroundings to residents or visitors."

Another attempt to get a solid handle on a complex *QOL* system is the environmental evaluation system (EES) developed by the Battelle-Columbus research team. EES (Whitman, 1971) was developed to be replicable, analytical, and comprehensive, broad enough to include all relevant types of environmental measurements and indicators as determined through an interdisciplinary perspective.

The system is based on four environmental categories, seventeen environmental components, and sixty-six environmental parameters. In using the system, each parameter would be defined according to one or more specific measurement, as appropriate. This is definition of *QOL* by category listing.

The system can be viewed structurally, on four levels. Thus, environmental categories are in general terms, components in intermediate terms, parameters in specific terms, and measurements in more specific terms. Each level links up to the level above. The categories and components are:

- *Ecology*
    - Species and populations
    - Habitats and communities
    - Ecosystems
- *Environmental pollution*
    - Water pollution
    - Air pollution
    - Land pollution
    - Noise pollution
- *Esthetics*
    - Land
    - Air
    - Water
    - Biota
    - Manmade objects
- *Human interest*
    - Education-scientific significance
    - Historical significance
    - Cultural significance
    - Mood-atmosphere significance

The National Goals Research (NGR) Staff report of 1969 (National Goals Research Staff, 1970) did not set any goals or offer any planning. However, it did compare a variety of national domestic strategies available to the Nation to guide the processes of change. President Nixon, in directing the staff, stated that the report should "serve as a focus for the kind of lively widespread public discussion that deserves to go into decisions affecting our common future." Although the NGR staff did not offer a definition of *QOL*, they did come to grips with the *quality of life* concept and attempted to outline the problem of *QOL* as it relates to a national growth policy. This effort also has contributed to the debate regarding growth, economic and social indicators, and the attempt to get at real measures of life's quality.

Dalkey (1968) suggests that the phrase *QOL* supplants such words as "happiness," "welfare," and the like, in current discussions of policy in the urban and domestic areas. Even so, he feels the phrase is just as vague. To eliminate this vagueness he proposes the development of a comprehensive set of three kinds of scales:

- Relatively objective measures (such as income, age, amount of communication with friends, etc.)
- Subjective ratings (such as job satisfaction, perceived social status, degree of excitement in daily activities, etc.)
- Global subjective scales (such as happiness, amount of worry, number of times thought of suicide, optimism about the future, etc.)

Using the Delphi technique Dalkey conducted an exercise involving nine factors of *QOL*, which settled into four main groups. The groupings were: (1) health; (2) status, affluence, activity; (3) freedom, security, novelty, with sociality midway between 2 and 3; and (4) aggression.

Later on, Dalkey, with Rourke (1971) defined the *QOL* "to mean a person's sense of well-being, his satisfaction or dissatisfaction with life, or his happiness or unhappiness." From their interviews 13 *QOL* factors were developed and rated, as well as 48 characteristics of *QOL*.

Another recent attempt at defining *QOL* (Schmalz, 1972) was also subjective: "*QOL* can be measured by determining the difference between an individual's state of being as he perceives it and the individual's aspirations, desires, and needs."

Christakis (1972 a:37,42) makes clear the need to consider individual value bases in developing *QOL* definitions. He states that *QOL* is a multidimensional entity of many components (such as the quality of housing, quality of education, quality of health care, etc.). He defines a social issue, or problem, as "the dissonance between the desired (or aspired) *QOL* level and the actual (or perceived) *QOL* level." He ties together man's search for meaningful ways to shape his future with the ecological crisis that now exists and that needs direct and prompt intervention. He then develops a framework for public participation in the goals and policy formulation process based on *QOL* considerations and value bases. Christakis also proposes a methodology for determining regional economic development futures, based on *QOL* and value base considerations.

4. THE HISTORY OF ATTEMPTS TO DEFINE AND MEASURE *QOL* IS LONG

Most of the attempts to deal with *QOL* and social indicators occurred in the 1960's.

For many years only economic indicators, such as the Gross National Product and the Consumer Price Index, have been available to decision makers to measure "progress" and the health of the nation. The failure of these indicators to account for non-economic factors has led to the quest for *QOL* indicators.

The Hoover appointed Research Committee on Social Trends was one of the earliest attempts in this country to develop the social side of the public equation. Appointed in 1929, it issued its report in 1933. William F. Ogburn, the director of the study, was a pioneer in social indicators. Three of the leading experts in social indicators today were once his students: Albert Biderman, Otis Dudley Duncan, and Eleanor Bernert Sheldon. The report was one of the first to stress the need for planning for the general welfare, observing that man's cultural heritage was mutating faster than his physical and biological heritage.

The Employment Act of 1946 established the Council of Economic Advisors, the annual Economic Report of the President, and the Joint Economic Committee in the Congress. This was the legal basis for the compilation and use of major economic indicators.

In 1962, Harvard Business School's Raymond Bauer asked why a system that was like the highly organized economic indicators could not be developed. He followed with a book (1966) in which he focused on the need to assess where the country is in relation to its values and goals. He discussed the need to evaluate programs to determine their impact as a means of facilitating the correct anticipation of the consequences of change. This book was a result of his studies for NASA in 1959 in which he noted that no true indicators of behavioral change existed.

The Social Science Advisory Committee (to President Kennedy), in 1962, urged the establishment of a systematic collection of basic behavioral data for the United States. The Russell Sage Foundation Annual Report for 1964-1965 announced an interest in social change and social indicators. Bertram Gross advocated, in 1966, the use of the Employment Act of 1946 as a precedent for developing a series of viable social indicators. The National Commission on Technology, Automation, and Economic Prograss, in 1966, called for social accounting, annual Social Reports to the President, and a full opportunity and social accounting act.

In 1967, Senate Bill S843, the *"Full Opportunity and National Goals and Priorities Act,"* called for an annual Social Report to the President, Council of Social Advisers, and a Joint Committee (of Congress) on the Social Report. Though passed, it was not enacted. It was introduced again in 1972 (Senate Bill S-5). Again it was passed by the Senate, but did not come to a vote in the House. Sponsored by Senator Mondale and others, its purpose is to help devise "a long-term strategy for well-being" (Mondale, 1967:3).

Although many theoretical articles and books have been written, not much actual research has been done.

The current debate centers on what social indicators can, in reality, actually do. On one side of the debate is the belief that social indicators will be able to identify and develop specific social goals, measure the progress toward attaining those goals, determine priorities among goals, and link policy tools to social objectives (National Science Foundation, 1971).

Sheldon and Freeman (1970) on the other hand, state that social indicators are not a panacea, but do have significant potential, such as improving descriptive reporting, providing an analysis of social change, and predicting future social events and social life. Social indicators cannot, they suggest, set goals and priorities, evaluate programs, or develop a national balance sheet.

The debate centers not on gathering the information but on what you do with it once you've gathered it. To help resolve the debate, the Social Science Research Council (headed by Eleanor Bernert Sheldon) is establishing a Center for the Coordination of Research on Social Indicators (to be funded initially by the National Science Foundation). The Center will work from the following pre-suppositions:

- Priorities and goals are more dependent on national values than on assembled data.

- Program evaluation necessitates the demonstration that the programs determine the outcomes (measured by indicators) rather than uncontrolled extraneous variables.

- The essential theoretical prerequisites for the development of a system of social accounts—defining the variables and the interrelationships among them—is particularly deficient, if not completely lacking.

A significant recent development is the study currently being done by the Office of Management and Budget, which will lead to a first draft of a "Social Report." The report is to help in the understanding of social conditions and social change in the United States. The publication, expected in the winter of 1973, will have no analysis accompanying its statistical presentation. The eight major social areas to be covered are: health; education; employment; income; housing and physical environment; leisure and recreation; public safety and legal justice; and population. OMB believes that these areas comprise the basic human needs and wants, and will reveal the general well-being of the entire population. Criteria for selection were that it should:

- Measure individual or family well-being

- Reflect a desirable output, or end products of a social process

- Include measures that could be significant in appraising circumstances in more than one area.

Perhaps the most significant recent development is the discussion regarding micro-level and macro-level indicators. As a national measurement of the nation's health, GNP has some utility. But it is on the macro-level. It is inadequate when applied to individuals. *QOL*, on the other hand, can easily be applied directly at the local or individual level with the same specificity that GNP relates to the nation. This is a micro-level measure. *QOL* is viewed by many as not applying to the nation as a whole. In their view, the only way *QOL* could be applied at the macro-level would be by homogenizing the country, forcing everyone to accept the same value standards.

One of the key difficulties in the modern world is the fear engendered by a lack of understanding among the country's pluralistic micro-cultures. Each person's view of the world is determined by his personal and group experience of life (Solzhenitsyn, 1972). To reduce the fears, Bohannon (1971) suggests adhering to civil rights laws based on equality and justice combined with sufficient intercultural education. This provides us with a typical suggestion for a national goal. Perhaps indicators, with sharply defined *QOL* components, can reveal how such a goal might be accomplished.

5. A GENERAL CONSENSUS DOES EXIST ON THE IMPORTANCE OF THE *QOL* CONCEPT AND THE NEED TO DEAL WITH IT

Although the literature offers no consensus on a *QOL* definition, a clear consensus does exist regarding the importance of the concept. People in business, in government, and in the universities are re-thinking the old tendency to equate a rising GNP with national well-being. It is recognized that the paradox of economic indicators continuing to progress (rising income, increasing employment) in the face of growing discontent (ghetto violence, campus strife, street crime, alienation and defiance) must be addressed (U.S. Department of Health, Education and Welfare, 1969).

Also desired is a means of handling swings and shifts in *QOL* pendulums. *QOL* for youth in the 1960's meant "doing one's own thing," independence, an absence of authority, an absence of guidance. Now there is some evidence of a swing toward a desire for order and standards. Wanted now in many cases are boundaries, direction, and guidance.

Yet an urgent question remains: whose *QOL*?

In the developing consensus as to the need for *QOL* measurement, consideration is being given to the need for the *QOL* measurements and factors to include physical and material concepts, as well as values and ideals.

In the following chapters, the *QOL* concept is discussed from two perspectives:

- The ways representative spokesmen of different life styles and values view the question
- The ways researchers in the different disciplines approach it

As may be expected, available literature on the *QOL* concept is dominated by the latter perspective. Economic, social, psychological, and "urban" approaches and interpretations of the *QOL* concept predominate.

The deliberations prior to, during, and subsequent to the *QOL* conference, however, have focused on the significance of life styles and their underlying values as a primary perspective in assessing *quality of life*. This represents an important contribution of the 1972 Airlie conference to the development of the *quality of life* concept as a decision making tool.

CHAPTER II

THE QUALITY PERSPECTIVES OF VARYING LIFE STYLES

Richard Nixon has stated: "In the next ten years we will increase our wealth by 50 percent. The profound question is: does this mean that we will be 50 percent richer in any real sense, 50 percent better off, 50 percent happier?"

This brings us again to the basic question of macro/micro-level understandings and the pluralism of our society: Is there a basic attitude of the American public? Or does each group or life style group in the U.S. (whether determined by class, age, interest, economic level, education, ethnic background, religion, sex, or whatever combination thereof) have its own idea of *QOL*?

1. *QOL* FROM THE BROAD PERSPECTIVE OF THE AMERICAN PUBLIC

At the EPA conference, Ted Gordon, who is President of the Futures Group presented some startling data regarding the values and priorities of the American people. His data were based on an analysis of polls taken over the past twenty-five years.

These data indicated a number of things about the value priorities of the American people:

- There is growing cynicism and distrust of the government
- Optimism about the future is declining
- Cultural and political views are becoming uncoupled
- A better standard of living remains at the top of the "personal hopes" list
- Owning a house is still the number one goal of Americans
- Vacation/travel come next among the priorities of Americans
- It would not take much additional money to make most people happy:
    - $10/week for 10% of the population
    - $10-30/week for nearly 40% of the population
    - $30-50/week for nearly 30% of the population
    - $50 or more/week for nearly 20% of the population

- Peace in the world remains a hope that more and more have
- New fears, developed only since the 1960's, are of inflation and drugs and pollution
- Fear of war is down considerably, but fear of national disunity is rising fast.

Gordon raised the question regarding the wisdom of concentrating on happiness scales. To do so, he suggests, is to invite totalitarianism.

Guy Pauker, Research Associate at Cal Tech's Environmental Quality Laboratory, presented additional information regarding the priorities of the American people. He stated that a survey in Watts indicated that the three most serious problems, in order, were stray cats and dogs; garbage; and noise. Yet many policy planners, viewing Watts from their own value bases or standards, would have thought of something else. It is believed that social indicators or *QOL* indicators would provide this kind of information regarding the feelings of the people as they actually are, not as planners may think they are.

Cantril and Roll (1971:1-15) have produced an excellent document on the topic of the hopes and fears of the American people. Their concern centers upon assessing accurately the changing values of the country and the responsiveness/resistance of the American people to this change. They use a "self-anchoring striving scale" to allow individuals to rate self and society on a scale of one to ten for past, present, and expectations for the future. Their effort reflects one method of developing social indicators, and determining how people view their own *QOL*.

They found that health and standard of living were most frequently mentioned in terms of both hopes and fears over the period of their study. The striving scale was utilized to obtain data in 1959, 1964, and 1971. It was discovered that:

- There is less preoccupation with the traditional "American dream"
- A shift of concern from strictly personal problems to social ones had occurred
- Concern regarding inflation has risen, concern regarding unemployment has decreased
- Fear of war has declined; fear of Communism has dropped

- Young people displayed a greater concern over a broader range of issues

- No truly meaningful differences in rating shifts existed between the races, although they did occur between classes

- Drug use and pollution did not register as concerns in 1959 or 1964, but figured prominently in 1971

- There is a new and urgent concern over national unity, political stability, and law and order (with 26% listing national disunity or political instability as a fear in 1971—a threefold increase over 1964)

These findings can be assessed on both the micro-level and macro-level. On the micro, or individual, level Americans express less concern with material aspects. A considerable sense of achievement and optimism is expressed regarding themselves. On the macro, or national, level the picture is different. Their concerns have broadened beyond what the individual can solve alone: drugs, inflation, pollution, and crime. All segments of the population express a fear of national disunity. The American people have felt that their nation is in trouble.

2. THE PERSPECTIVES OF YOUTH

At the EPA *Quality of Life* conference, Stephen Kaffa, Director of the Student Farm Program, University of California, provided a youth oriented perspective of the back to the earth movement—celebrating work with the hands. Self-identity seemed more certain when the youth of the student farm worked with their hands and got them dirty. Emphasized in his presentation was the need to touch things and to have responsibility for growing things. Personal relationships were emphasized. A social climate was described as being of kinship in principle, without contracts or competition. The desire was happiness and the attempt was to create a living environment in which happiness would be continuous. Reflected was the value system of youth from middle and upper-middle class homes.

The term "youth culture" is a term that has gained currency during the past decade (Berger and Berger, 1972:223). Today the term has connotations not only as evidence of the massive opposition of youth to the social-cultural status quo, but also as the harbinger of the future society. These latter views can be seen in such works as Kenneth Kenniston's *The Uncommitted* (1965), Theodore Roszak's *The Making of a Counter Culture* (1969), and Charles Reich's *The Greening of America* (1970).

Perhaps Yale's Kenneth Kenniston (1965, 1968) has provided us with one of the best summaries regarding youth today. He identifies their life style with the following generalizations:

- Their identity, like contemporary history, is fluid and indeterminate
- They identify with their own generational movement rather than with cross-generational organizations, institutions, ideologies
- They conscientiously seek to meet others with an open and trusting manner
- They want to be sexually and expressively free
- They think in terms of inclusiveness, which allows them to empathetically identify with aliens, the poor people, and other nations
- They oppose the "worship" of technology
- They seek new participatory forms of organization
- They favor discovery and exploration over academism

"Youth" is of course not the homogeneous grouping that the popular media tends to portray. Obviously, young people reflect a wide range of values. Nevertheless there are some values which the youth of the nation generally hold in common. Such values as those listed above must be considered in any *quality of life* assessment that is responsive to the perspective of youth.

3. THE PERSPECTIVES OF WOMEN

Dr. Barbette Blackington, Director of the International Institute of Women's Studies, stated at the *QOL* conference that the central question for the 21st century regarded how we go about reordering institutions according to how people feel. She stated that professional women feel that their intellectual status affects their relationship with men. Women, she said, basically want men to like them. Her presentation in discussing the women's perspective focused on men. She talked of the pressures on men in a highly competitive society and the effect of these pressures on their human relations and sense of well-being.

The "women's movement" is at present basically a white middle/upper-middle class movement. The essential argument is that women are a slave class seeking liberation. They are asking for equal pay for equal jobs and for equal opportunity to get those jobs. They are asking for the men to share in the rearing of the children. They are asking for men to accept the gentle side of being human. They are asking to be freed from slavery to daddy and to brother and to husband. They are asking to be free to determine for themselves whether or not they shall engage in sexual activity and whether or not they will have any child they may carry, i.e., the freedom to have abortions if they so choose.

What of the changes in other values which affect women? For instance, the conventional wisdom at the White House Conference on Children in 1960 stated that if a woman wanted federal support for her children, she had to stay home and take care of them. The conventional wisdom of the 1970 White House Conference on Children stated that the support would be forthcoming only if the mother worked.

For those attempting to construct indicators of *quality of life* the problem is further compounded by the great dearth of literature until recent years. The literature that has existed has been written mostly by men and is viewed by the "movement women" as reducing women to an inferior status. The psychological problems of low self-esteem and low achievement motivation as it relates to women affect their concept of *quality of life*.

4. THE PERSPECTIVES OF BLACKS AND OTHER RACIAL MINORITIES

Carlos Campbell, Special Assistant to the Assistant Secretary of HUD for Community Planning and Management, noted how television helped to set the stage for social clashes by portraying a *quality of life* that is not accessible to minority viewers. According to Campbell, the "genocide question" is an important *QOL* matter from the minority perspective because it is real in a cognitive sense. For them there is precedent in the experience of Hitler's Germany and the Afrikaners' South Africa. Given the fact that on half of the prison population of the country is black, that there is a higher percentage of blacks unemployed than whites, and that infant mortality is higher among blacks, it is not difficult to think in negative terms. Belinsky can always change his name to Bell and move to the suburbs. No name change is going to enable a black to go unnoticed in a white suburb. The question is one of choice, and the options available to blacks are fewer than those of whites.

Another *QOL* problem for blacks is the lack of black success models for the young. The affluent are usually pimps or dope pushers running around in expensive clothes, big automobiles, with beautiful women on their arms.

Although there is no written rule concerning the advent of new developments, it is Campbell's view that for the present, it takes a crisis to bring the country to focus on difficulties in the black community. Watts and Attica are two cases in point.

From a *QOL*/public policy standpoint, the misunderstandings of history exacerbate the problem. Although it is true that other ethnic and racial groups began in the slums of our cities, four significant differences exist:

- Color, as mentioned above (you can change your name but not your color)
- Earlier immigrants to the shores of America had crafts and skills that were needed
- There is no longer great opportunity in moving West in the great migrations
- There is the effect on psychological motivation of the heritage of working as slaves.

Policy/decision makers may well assess their knowledge of the categorical groups, such as:

- *Races* (the Negro, Indian, Eskimo, Puerto Rican, Spanish, Oriental, Middle Eastern, Chicano–the obvious minorities, as well as other minorities)
- *Ethnic* groups (Greek, Polish, Irish, Italian, German, Scandinavian, Russian, etc.)
- *Religious* groups (Protestant, Roman Catholic, Greek Orthodox, Jewish; also Protestant includes over 250 branches, and that there are a myriad of oriental and other cults and sects springing up all over America)
- *Sex Oriented Groups* (such as the homosexual)
- *Special Interest* groups (sports fans, classical music fans, rock music fans, country and western music fans, needle pointers–including many executives–card players, potters, handicraftmen, chess players, etc.)
- *Physical* (short, tall, crippled, in wheel chairs, blind, deaf, dumb, ugly, etc.)
- *Geographical* (urban, suburban, country, mountain, valley, desert, plains, cold, heat, sun, rain, water, snow, sand, dust, etc.)

- *Economic* (wealthy in abundance, just rich, affluent, well off, poor, destitute, getting by, poverty level)
- *Cultural* (highly sophisticated, mildly sophisticated, not sophisticated, gauche, living in a cultural ghetto–i.e., isolated–such as Harlem or Scarsdale)
- *Education* (lots of formal education, no formal education, a little formal education, lots of practical knowledge, no practical knowledge, wise, sensible, foolish)
- *Age* (babies, children, youth, young adults, middle aged, elderly, aged, ancient).

A key to measuring and planning for *QOL* in such a pluralistic society is for the planner/decision maker to be cognizant of such unique values of minority populations. Social unrest which affects the *QOL* of the nation is rooted in the *QOL* of the nation's constituent minority groupings.

5. THE PERSPECTIVES OF THE AGED

Ms. Jessie S. Gertman, Deputy Chief, Division on Aging of HEW, reported that by the year 2000, it is estimated that there will be between 28 and 40 million "oldsters." The major problems of the elderly are health and income. Another serious *QOL* concern is that of retirement. People who are still able to work are forced to retire, some at 65, others earlier. Most oldsters, however, report high satisfaction or happiness.

In a country that worships youth, the elderly are indeed the "unwanted generation." While more and more programs are developed for the young, the elderly are gradually but continually devalued and excluded. While youth play increasingly important cultural and political roles in the West, the elderly play continually diminishing roles.

Yet both groups are remarkably alike. Both are at the extremes of the age pyramid–largely unemployed, introspective with bodies and psyches in greater process of change, and heavy users of drugs. Time is an obsession with both groups. Where youth is worshipped, however, the aged are avoided. The aged are treated as a "lower class", while youth are treated as an "upper class." After racism and sexism, the latest, rapidly growing "-ism" is age-ism.

One of the most interesting aspects is that of senility. It is a catchword to describe old people. Yet senility is not peculiar to the elderly. In administered senility tests, college students were found to be more neurotic, negative, dissatisfied, socially inept and unrealistic than were the oldsters. The significant difference is that the young people were usually treated if their psychological problems were severe. Similar symptoms in oldsters were passed off as par for the course for the elderly.

Many *QOL* factors are relevant from the perspective of the aging: isolation, joblessness, decrease in mobility, ill-health, low income, legal problems, death and dying, out of date education, low energy, loneliness, etc. Although the more blatant injustices of "age-ism" can be alleviated by governmental action and familial concern, the basic issue will not be solved, it is suggested, until there is a fundamental reordering of the basic values of our society in respect to the aged.

Recently, the aged have organized their "cane, crutch and Cadillac vote" to put pressure on banks and cities and have picketed in wheelchairs. Due to their increased numbers, they are out to flex their political muscle and are being rather successful at it (Isenberg, 1971:1).

Important *QOL* questions for the future regard the roles the oldsters are expected to play and are allowed to play. How are they to maintain their own sense of identity as they pass through the biological stages of life? How do they relinquish the role afforded by the social structure at an earlier period of their lives? What is the effect of having to let go?

* * * * *

There is a wide-ranging continuum of life styles from which to view *quality of life* values. The perspectives presented at the conference were in no way representative of the nation as a whole. The views presented may well have been representative only of those individuals making the presentations. Nevertheless, the conference illustrated just how basic the various sets of life style values are to the concept of *Quality of Life.*

Each life style grouping needs its place in the sun. The *QOL* of each life style involves considerations related to the four factor areas of *QOL*: the social, the economic, the psychological, and the environmental. No public planning, no decision making should be attempted without first taking into consideration the varying and multitudinous values and priorities of the different life styles.

CHAPTER III

THE APPROACHES OF DIFFERENT DISCIPLINES

The *quality of life (QOL)* concept has become a focal point of converging economic, social and environmental considerations. The wide range of backgrounds of those at the *QOL* conference as well as the range of issues raised bear dramatic testimony of this fact.

The different disciplines of economics, sociology, environmental science, psychology, etc., which heretofore have tended to approach the concept "*quality of life*" in terms of their respective methodologies, concepts, techniques, "worldview," etc., have been turning more and more toward interdisciplinary cooperation. The perspectives of each of these disciplines in approaching the *QOL* concept is the subject of this chapter.

The purpose of the Airlie conference was to focus on *QOL* issues, not to solve the complex problems related to them.

An effort has been needed to free the discipline-locked fragments of *QOL* research in order that they might be put together into a cohesive whole. Innovative efforts, both in intellectual endeavors and in organizational cooperation, is necessary if the knowledge being gained related to the concepts of *QOL* and the social/physical environment is to be of maximum use.

We have already discussed the difficulty of getting people of varying life styles to agree on what constitutes a quality life. Men and women of the different disciplines, of course, carry their personal values into their professional roles and approach subjects from the particular vantage point of their discipline. The *QOL* concept, to be an effective tool to decision makers, requires an interdisciplinary perspective.

This chapter will attempt to weave together the many contributions made by the conference participants. It will be difficult to assign credit, since so much of this is the result of the on-going synthesis, the interdisciplinary interaction, of the conference process. It might be useful to define our use of "interdisciplinary" as opposed to "multi-disciplinary." "Multi-disciplinary" refers merely to gathering the information of the disciplines. "Interdisciplinary" means proceeding from the basis of an integration of the knowledge at hand, avoiding temptation to subjugate other disciplines to support one's own specialty.

One of the difficulties in approaching a subject such as *QOL* is that of basic methodology. At the conference, Maruyama (1972:1) made the point that our forms of logic and philosophy are not always up to the job at hand. He calls for the abandonment of the traditional, absolute forms of logic, which are uniformistic, hierarchial, classificational, undirectional, competitive, quantitative, object-based, and self-perpetuating. He advocates that we adopt instead the emerging form of logic that is heterogenistic, interactionist, relational, mutualistic, symbiotic, qualitative, process-oriented, and self-transcending (self-renewing). There are others who would say just the opposite. The direction to take may well involve and integration of the two forms of logic in developing an interdisciplinary apporach.

Three major areas of public welfare–economics, social concerns, and environmental conditions–are the ones to which indicators are being either applied or developed. The *quality of life* concept cuts across these three areas. The question is thus raised as to whether or not a public consensus can be achieved that can be applied to the whole of society .

1. AN INTERDISCIPLINARY PERSPECTIVE

A number of helpful suggestions came from the *QOL* symposium regarding how to approach a *QOL* definition. Called for was a public and open discussion of the indices to be considered, plus the development of indices by which the citizen could evaluate government action. Another suggestion was to adapt methodologies to the local level.

Most symposium attendees agreed that the development of *QOL* indicators was necessary for several significant environmental reasons:

- As an early warning system to head off pending disaster
- As an educational device to arouse lethargic citizens about a danger or an opportunity to their environs
- To assist decision makers in ordering their priorities

In approaching a definition of *QOL*, however, a caveat was issued regarding an attempt to compress it to fit a pet methodology.

Concern was expressed regarding how to relate labor, work, leisure, performance criteria, etc., to *QOL* and the environment, as well as what to do with non-measurables: love, affection, status. A general consensus seemed to be expressed that a difference should be maintained between happiness and welfare–that the environment was one thing, a person's feelings something else. Therefore, *QOL* measurement should be broad enough to include the whole environmental, economic, and social system.

It was also suggested that different indices be devised and be allowed to compete against each other: i.e., with a pluralist society why not have pluralist, and thus competing indices? This could help develop either an overall index or at least demonstrate what such an overall index could not do. More theorizing, conceptualizing, and philosophizing about *QOL* definition and what to do about it were also suggested. Regardless, it was agreed that a solid, firm, intellectual base was necessary if correct decisions were to be made from adequate definitions. In approaching *QOL* definitions from the environmental perspective, it was suggested that a real world model be used, which would mean a behavioral model.

An often referred to book at the conference was that of the MIT study, *Limits to Growth* (Meadows et al, 1972). Conferees discussed the five major components for the more important environmental considerations raised by the Meadows group:

- Population increase
- Agricultural production
- Non-renewable resource depletion
- Industrial output
- Pollution generation

Many participants considered that basic to a discussion of *QOL* was the ability to maintain a life support system for mankind and other forms of life. According to Meadows, et al, the life support system is limited: the earth's resources cannot support present rates of economic and population growth much beyond the year 2100, if that long, even with advanced technology.

In the literature, Buckminster Fuller (1969:156) has suggested an approach whereby the problems pointed up by the Meadows book can be alleviated. Do more with less. The consequences of this idea for those enamored with GNP are enormous; it doesn't necessarily mean reduced GNP,but it certainly implies a different way of measuring it. The vision of maximum abundance, which Fuller sees as now being within our grasp, is translated as utopia. The only other alternative in his view is oblivion, which will be the result of using the means of destruction instead of the real wealth of the world: i.e., information and energy. To accomplish this requires a "design revolution" that must come "in time to accomplish "Utopia" before "Oblivion" occurs."

These doomsday projections may serve positive ends, however, if they can be instrumental in getting the nations of the world to work together to escape the consequences of not cooperating. As Commoner (1972:49) has pointed out, "peace among men...must precede a peace with nature."

2. THE ENVIRONMENTAL PERSPECTIVE

Environmental approaches to *QOL* definition attempt precise formulation in order that the *QOL* factor can be included within various models of the environment and in environmental planning and management.

The problems of the environment are not new. Interest in them, however, on a wide scale, however, is new. Environmental management is thus an important albeit new concern for decision makers, a concern that now includes a broader concept (*QOL*) and provides a new platform for our continuing analyses of our world.

QOL considerations are now possible because man is willing to redefine his relationship to his environment. From having feared the environment, man came to understand it, used it, then abused it, and is now concerned about what he has done and what he can do to invest his physical and biological world with quality (National Goals Research Staff, 1970) The desire to achieve oneness with nature is what Burstein calls our new religion (Burstein, 1972:88).

There is a dawning recognition of the fact that the values of the society will determine the quality of the environment and that, depending upon the costs the citizen is willing to bear, that level of quality will be obtained. Not to be forgotten is that improvement of the environment provides other benefits, not the least of which are aesthetic and moral satisfaction (in addition to contributing to life survival).

A key factor in developing environmental *QOL* factors and components is weighting them. This is done through a series of trade-off analyses. How does one make trade-offs even among environmental factors without making it merely a trade of one form of pollution for another (such as reducing air pollution by washing smoke and sluicing it out into the water courses; or reducing auto exhaust by limiting its use, but then precipitating transportation problems and affecting the micro-environments in which people work and live) (Perloff, 1972:III-10).

How are human beings to be factored into environmental equations without automatonizing them? For instance, the New York Academy of Sciences meeting in early 1972 featured a paper that advocated the "management of natural and man-made systems, on a local, regional, national, and global basis" by further developing homo sapiens into "mechanical man," which would be of a higher evolutionary form. "Mechanical man" would have "a much more complex sensory and motor organization" and, even more fundamental, "a better organized cerebral mechanism" (Lukasiewicz, 1972:373).

Certain environmental indicators regarding *quality of life* can be cited as possible beginning points in discussing quality in terms of human welfare: the extent of air pollution and the number and percent of persons experiencing air pollution at levels hazardous to health (including the level of pollutants in the air of a given area by type); a comparison of different areas in terms of air quality; the number of polluted bodies of water and the number of persons living within certain radii of the polluted bodies; and the numbers of bodies of water and percentage of given rivers and streams in terms of specified pollution levels hazardous to health.

A measurement system is vitally necessary if we are to be able to accurately assess the effects of dumping wastes in the oceans, the rivers, the skies, and anywhere else man can find to dump. Will the mercury getting into fish seriously endanger the biosphere and the eco-cycle, for example? What will be the effect of unrestrained population growth: starvation, disease, catastrophic war? If we cannot measure adequately and accurately the results of current and projected environmental policies, then we cannot really plan for a balance and harmony between nature and man's relationship with nature. Without this balance there can be no *quality of life* for human beings.

3. THE ECONOMIC PERSPECTIVE

Traditionally the economic approach to achieving *quality of life* definition was "by the numbers." The economic methodology was to interpret quality in quantitative terms.

Increasingly, however, economists like Mancur Olsen* have recognized the need for incorporating qualitative factors in their technical analysis, input-output studies, econometrics, operations research, game theory, and linear or mathematical programming. Steps are being taken to address the knotty problems of human action and behavior in economic methodologies. The economists are beginning to pay attention to the fact that such concepts as production and distribution, goods and services, commodities and performances are related to the human actors who control them and who, in turn, are controlled by them.

The top priority for any nation historically has been its economic health. Consideration of the humanistic elements of life, the stuff of social consciousness and social indicators, has generally come after the basic problems of economic survival and growth have been overcome. Thus in America today, the "economics of quality" is the subject of considerable study.

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The application of macro-level indicators at the micro-level has been a problem for economists. The Depression nurtured the idea of economic indicators that could be used to control economic fluctuations and thus maintain economic growth. The economic measure became the major indicator of prosperity and well-being of societies and nations. Thus, as long as Gross National Product rose, it was assumed that the prosperity and well-being of the individual were also rising.

Recent studies (*Agendu for the Nation,* 1968) have shown, however, that economic prosperity has no high correlation with the solving of social ills.

Widespread social unrest and the questioning of the legitimacy of certain traditional institutions have stimulated a major reexamination of socioeconomic, environmental and behavioral phenomena both within and outside the economic context (Kamrany & Christakis, 1969:1-2).

Dr. Fred Singer (*Conference Board Record,* 1971) of the University of Virginia and an Airlie conference participant, has made the point that predicting the economic future is complicated since each GNP item behaves in a different way. "But what are we trying to optimize?" he has asked. "Surely not GNP. Even GNP per capita is not the right index, since it corresponds to an index of national production rather than consumption. We want to achieve the highest *quality of life* for the population as a whole. We must first define *quality of life* acceptably, and operationally–i.e., the definition will incorporate a method for calculating *quality of life* and expressing it in some unit, like dollars. Our next job is to devise a way to translate national income accounts (like GNP) into a more meaningful expression of well-being–an index of *quality of life (QOL).*

He has presented a definition of *QOL* from an economic perspective:

"In our society, where material comforts contribute importantly to what people perceive as happiness, a loose definition might be 'having as much money as possible left over after taking care of basic necessities, and having the necessary time and opportunities for spending it in a pleasant way.' This also means 'having a maximum range of choices for a way of life'." This definition satisfies our criteria reasonably well. It measures the *quality of life* in dollar terms by calculating potential consumption and assigning a monetary value to free time. Specifically, we start by examining the national income accounts, which aggregate the nation's output, to see which items contribute to *QOL*, and to what extent. We include amenities like leisure time and environmental quality–not counted in GNP. We subtract items that enter into GNP but are really disamenities which don't contribute to *quality of life*. Among the most important are pollution and increased distribution costs in crowded urban areas.

Many economic planners and policy makers who have been in the habit of reducing everything to the quantifiable are now recognizing the heretofore unquantifiable: human needs for "myths," festivals, dignity, love, belongingness, etc.

Income distribution is considered by many as a major component of an inspired *quality of life* for everyone. It has been assumed by some that *QOL* can only be achieved by providing everyone in the country with sufficient income support.

Economists have been confronted by the fact that members of the middle and upper middle class–those already free from want, tyranny, ignorance, and superstition–are among the loudest declaring themselves the most oppressed and miserable. The economic approach is increasingly recognizing that materialistic quantifiers no longer suffice as the base of *QOL*.

4. THE PSYCHOLOGICAL PERSPECTIVE

The psychological approaches to *QOL* center on human needs and their fulfillment. Many of these needs involve noneconomic factors. Ignoring these needs is what narrows many planners' and thinkers' vision to thinking of *QOL* only in terms of distribution of economic resources (James, 1972:II-4). *QOL*, however, must be approached in terms of patterns, taking into consideration everything that makes up the mosaic of a life.

This question of what are man's fundamental needs is not a new one. Behavioral scientists, political scientists, theologians and philosophers alike have long debated the question. A consensus has formed over the years that human needs are many and varied, and that the particular socialization process of particular groups will greatly influence the sum and substance of the needs. It has also been found that the distinction between the primary drives and the more complex secondary or learned social motives is quite often more apparent than real. Again, it depends upon the sociocultural systems (family, neighborhood, geographical region, etc.) (Proshansky, et al, 1970:170).

"Physical setting" needs are those that express desired properties of given physical settings in the attempt to satisfy day-to-day motivations, including hunger, good job performance, and parental role. It could thus be said that "physical setting" needs are in most instances mediational or instrumental in character and provide the basis for understanding the emergence in the individual of such complex, environment-related phenomena as privacy, territoriality, personal space, and others (Proshansky, 1970:171). Related to and affected by these physical setting needs are existential needs. Together they comprise the substance of various theories of "needs hierarchies." The conference discussed a number of these approaches as a means of grasping more fully the *QOL* concept.

Dalkey (1972) and Dalkey and Rourke (1972) used the Delphi technique to develop a catalog of needs. Their list of factors and definition of *QOL* can be found in Chapter I.

Martin Buber approached *QOL* (although he did not use the phrase) in terms not of material abundance and status acquisition but of satisfaction from living "the good life" and relating to others in a non-objective way. His concept of "I and Thou" mutually foreshadowed much of the current writing concerning *QOL*.

Skinner (1971) suggests a behaviorist theorem: to achieve the *QOL* you want change the environment around you. For Skinner, the important factor is not man's choice but rather the environment (natural and social). Skinner would have us jettison such sacred cows as freedom, mind, dignity, will, and virtue. In Skinner's world, man would be "controlled by the world around him, and in large by other men." This is another form of the quest for a universal *QOL* standard for everyone.

Toffler (1970:417) viewed *QOL* as something that a person could attain if he learned to cope with change. Having "copability" would prevent "future shock." To achieve one's preferred *QOL*, he calls for the creation of a "consciousness needed for man to undertake the control of change, the guidance of his evolution."

The basic factor or component discussed at the conference as in the literature is that of satisfaction, fulfillment, or growth. *QOL* can also be discussed in terms of alienation–that apathy, deviance, and organized protest are the results of pervasive disaffection with the times due to the nature of the industrialized society. It can also be considered in terms of the impact of family structure on personality formation, which would include child-rearing techniques, the nature of the family relationships, and the experiences in alternative family styles, such as the communes or intentional communities. The manner of adult socialization would also include those experiences of transition from total institutions–prisons, mental hospitals–to "freedom" in society. The impact of group membership on attitudes and behavior (groups, gangs, fraternities, the army, etc.) is still another approach. All of these factors relate to the fulfillment of some need.

Yet in our search for *QOL* approaches we find that little is really known about the relationship between attitudes and behavior. The hierarchy of needs theory attempts to bridge this gap. According to the various theories, a person moves from one needs level to another when the current level no longer satisfies.

The most famous needs theory is that of Abraham Maslow (1969:67-68). He is the father of the concept of "self-actualization." From many viewpoints, *QOL* is defined in psychological terms as achieving "self-actualization." For Maslow, man evolves from lower to higher levels of consciousness. The five levels are survival, security, belongingness, esteem, and self-actualization. To Maslow, the self-actualized people are "gratified in all their basic needs–embracing affection, respect, and self-esteem...belongingness and rootedness...love needs...status, place in life...respect from other people...feeling of worth and self-respect."

A different kind of needs theory is the levels of existence theory of Clare Graves (1970). Graves lists eight levels (with the caveat that there may be more; but so far, all he has been able to identify empirically are eight). Each level of existence has its own existential state. Each level of existence has its own motivational system and end values. Most important to the theory and a major distinction from other theories, each existential level has its own peculiar existential problem. Thus, no matter how "high" you go, you cannot become perfect or self-actualized.

In a recent and significant book in the field by Campbell and Converse (1972:444, 458, 459) they discuss *quality of life* from the standpoint of the quality of personal experience. They discuss such states as frustration, satisfaction, disappointment, and fulfillment. They say these are from the individual perspective, as in "the eye of the beholder." They assume that "satisfaction and dissatisfaction are experiences that most people can report with reasonable validity." Then we read this: "The revolution of rising expectation will go beyond the demand for better housing and cleaner air to the requirement of a fuller life." The full life, however, is based on the Maslow perspective: "We assume that the experience of failure to fulfill oneself is important to the individual, however exalted or modest the personal aspiration may be."

Alienation, a negative form of *QOL*, and other psychological misery could well be the result of people attempting to set a *QOL* goal that is impossible to attain. Maslow developed his theory on a study of his interviews with 100 very wealthy, successful men. Graves developed his theory over a period of twenty years, observing and testing individuals from every socioeconomic level.

Although this is not the place to take up the age old question of what is happiness, we can nonetheless avoid some pitfalls by not trying to equate well-being, satisfaction, and fulfillment with a position on an income scale.

5. THE SOCIAL PERSPECTIVE

No one would argue with the fact that more intensive field work is necessary if we are to achieve any sense of staying in touch with reality as it is perceived. Paukers comment, on the Watts mood cited earlier, is a good example. The social perspective is best seen through the discipline of sociology.

Sociology provides a number of useful concepts by which to approach the various verbal and acted *QOL* statements: class, race, ethnicity, values, matters of "ultimate concern," etc. What many policy analysts and decision makers seem to forget all too often is that their backgrounds in relation to these categories greatly influence their "scientific" approach to the development of indicators that will measure the *quality of life*.

Sociology can provide insights valuable to anyone concerned with action in society; but this action need not mean "social" work or humanitarian work. Knowledge established scientifically can be used for good or evil. Sociology is "value-free" in that its purpose is scientific inquiry and integrity (Berger, 1963:12, 15). But sociology is very important in the understanding of the search for *QOL* definition. Our increasingly complex and variegated society (i.e., pluralism) could collapse in howling chaos unless a measure of mutual understanding exists and is fostered in the plurality of social groups and social worlds coexisting together (Berger and Berger, 1972 b:363).

The sociological view is a particularly necessary element of an interdisciplinary approach to *QOL* definition in a vastly pluralistic society such as ours. For instance, sociology has brought to our attention the fact that modern man is the first to be provided with discretionary leisure time. Although the development of leisure time has been hailed by many, for others who do not know how to fill their leisure time, it is a curse.

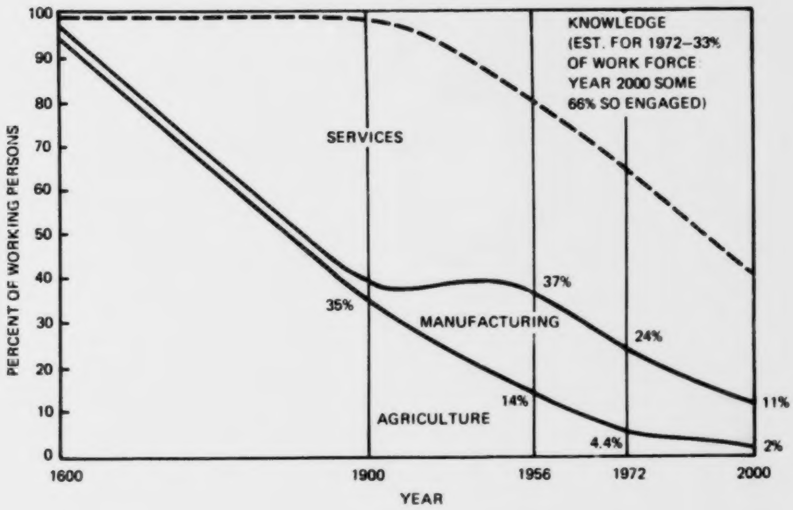
One of the major methods related to *QOL* is that of social indicators. They reveal that society is a community of individual and collective meanings, that are objective and subjective. Both must be taken into account and quantified. The social perspective can be used to help clarify some of the confusion between ends and means (or output and input) and to help focus on the distinction between the two (Terleckyj, 1970:1).

Two components significant to the discussion but often confused are those of "class" and "race and ethnicity." They are particularly useful to the understanding of suggestions and policies regarding economic housing groupings, educational transportation policies, and quota systems for job hiring and school admission.

"Class" understanding is most important to *QOL* discussions. Parents want their children to live in neighborhoods and to go to school with children of comparable class position. Without making a value judgment, we can state that one factor in *QOL* definition for many parents is to be able to shield their children from the social and cultural realities of lower-class life, particularly if the parents have experienced it personally (Berger and Berger, 1972 a:20).

Important in ascertaining *QOL* components is that value preferences are more akin to socioeconomic position than to race. Rokeach and Parker (1970), found that, as economic differences between the races disappear, other differences disappeared also. Thus, different *QOL* definitions may be necessary for each of the different classes.

One of the biggest components in the equation of *QOL* definition is that of change. A feeling for the extent and magnitude of change in modern life can be seen from the chart below regarding the evolution of socioeconomic organization as a structural underpinning of society (Molitor, 1972).



Many observers believe that the traditional industries–agricultural and manufacturing–are declining in terms of the commitment of human resources while output continues to increase at incredible rates. The actual result of this and of its implications are not yet clear,but it seems safe to say that a major shift in social values will result. Several shifts may occur; for example,

- Incentives to discourage people from working may be devised

- Work may become a privilege and a coveted status symbol, not a necessity
- Life without work from cradle to grave may be possible
- Use of leisure time may become our main preoccupation
- An economy of abundance, not one of scarcity may prevail
- Undreamed-of equality, and economic sharing may become possible

Such epochal changes in the society make it clear not only that are we in the midst of a values revolution, but also that hard definitions of *QOL* at the macro level will be impossible except in the most general terms. The implications for *QOL* measurement are clear: whatever measurement system(s) is (are) devised must be fluid, flexible, and capable of rapid adjustment to the new technological realities and their ramifications. Also people must realize contemporary society, more than ever before, needs citizens with the ability to understand the situations and social worlds of others (Berger and Berger, 1972 b:362).

6. THE INTEGRATION OF INTERDISCIPLINARY PERSPECTIVES

It should be obvious by now that no one answer yet exists. Indeed, it should be clear that the *quality of life* concept has yet to provide us with the full understanding of how its utilization will be of greatest benefit to decision makers. The discipline of history provides some insights that could be most useful to the *QOL* definition task before us.

A sense of history can help to dispel the "national hypochondria" that has caused our "imprisonment in the present" (Boorstin, 1970:27). A sense of history enables comparisons and brings to bear the wisdom of ancestors and the culture of kindred nations. The historical perspective is one check on the sometimes emotional and utopian programs suggested (as well as the sometime emotional and utopian re-interpretation of past history).

Boorstin (1970:28) puts it quite bluntly when he states:

> We flagellate ourselves as "poverty ridden"–by comparison only with some mythical time when there was no bottom 20 percent in the economic scale. We sputter against The Polluted Environment–as if it was invented in the age of the automobile. We compare our smoggy air not with the odor of horsedung and the plague of flies and the smells of garbage and human excrement which filled cities

> in the past, but with the honeysuckle perfumes of some nonexistent City Beautiful. We forget that even if the water in many cities today is not as spring-pure nor as palatable as we would like, for most of history the water of the cities (and of the countryside) was undrinkable. We reproach ourselves for the ills of disease and malnourishment, and forget that until recently enteritis and measles and whooping cough, diphtheria and typhoid, were killing diseases of childhood, puerperal fever plagued mothers in childbirth, polio was a summer monster.

These are all factors of what we would call "negative" *QOL*. In their own day they were considered "facts of life."

This suggests that the *QOL* concept, as a tool for decision makers, must take into consideration what has occurred in the past to be better enabled to understand the present, particularly as the present extends into the future. It is true that "Doomsday is quite within our reach, if we will only stretch for it" (Wainwright, 1972:28). But, to prevent it, decision makers need to hear not only the "awful truth," such as in *The Limits to Growth* by MIT or *A Blueprint for Survival* from scientists of Great Britain (Meadows, 1972; "A Blueprint," 1972), but also what can be done to prevent the awfulness.

The Federal Government is more than aware that our environmental problems stem from not only our technological and economic successes but from our philosophical view of nature as well (National Goals Research Staff, 1970). One of the reasons for attempting to factor the *QOL* into ecological studies is to provide an unprecedented expansion of our knowledge if considerations regarding our current technological and economic alternatives are to be made in light of what we are beginning to discover as necessary to achieve true long-range ecological balance Viewing *QOL* from the perspective of the various disciplines as well as from the perspective of varying life styles should help to facilitate the development of new means by which decision makers can do their jobs.

CHAPTER IV

QUANTIFICATION OF THE *QUALITY OF LIFE*

We have seen that the *quality of life (QOL)* concept, though it attracts widespread interest, is by no means precisely defined. There are different life quality perspectives associated with various life styles, and we have touched on some of them. There are also disciplinary perspectives to the problem of defining *QOL*, reflecting economic, psychological, sociological and ecological viewpoints. And there are widely different views on what *quality of life* actually means, as conditioned by the insight one wishes to gain. The social researcher, in other words, has different needs, and hence different perspectives, from the decision maker or government planner. Unfortunately this multidimensional nature of the life quality concept, though it implies an intellectual richness, limits the usefulness of the concept. In essence, it is too illusive a concept, at least as we now understand it, to serve as more than a focus for loosely structured philosophical discussion.

1. THE NEED FOR *QOL* QUANTIFICATION

Because of the diffuse, imprecise nature of the *QOL* concept as it is currently understood, there is an acute need for making a serious attempt at quantification. This is particularly so since there is widespread discussion of the possibility that *QOL* measures may be useful in government decision making, planning and evaluation. Without a precise definition of what is meant by *QOL* (and that definition may of course vary somewhat as a function of context) and without some valid and reliable procedure for measuring whatever parameters are associated with *QOL*, however, there is no way in which the concept can be used in a meaningful way as a planning tool. Indeed, without such quantification, or at least a clearly defined algorithm for attempting such quantification, the concept cannot be intelligently discussed because there is no common framework for comparison of different ideas or approaches.

One can legitimately ask why is it necessary to compare what may seem to be intangible elements of *QOL* in a quantitative way, and we shall consider the types of concerns which generate such questions shortly. For the moment, however, the point is simply this: If *QOL* is to be applied to improve the way in which we make decisions about our social programs and our future, then it must be quantified in the best, and most acceptable, way we can devise.

2. CONCERNS ABOUT *QOL* QUANTIFICATION

There is a wide variety of legitimate, and deeply felt, concerns about any attempt to quantify *QOL*, and these concerns were vociferously, and often

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eloquently, articulated at the 1972 EPA Conference on the *quality of life* concept. Roughly speaking, one can group these various concerns into two generic categories: The "cannot do it" and the "should not do it" declarations. Clearly there is some tendency for these two classes of concern to overlap, but in the main the issues raised by each camp are distinct. Though we shall focus primarily on the concerns expressed by those conferences opposed to *QOL* quantification, it is important to emphasize that these are "positive" concerns as well. Virtually all those who favor a research effort to explore *QOL* quantification recognize that there are pitfalls to be avoided and serious concerns to be dealt with. Generally speaking, the points raised by these cautious optimists echo those of the negativists, though with reduced intensity. Hence by discussing the negative viewpoints expressed at the conference, we will treat most of the major concerns.

Those who argue that one cannot possibly quantify *QOL* in a meaningful way raise a number of compelling points. The one voiced most frequently is that the parameters, or factors, which are important in determining *QOL* are so highly individual that any attempt to describe *QOL* for a group, no matter how small, will inevitably miss the mark as far as the individuals in that group are concerned. Virtually everybody acknowledges that there are distinct differences between, for example, urban slum dwellers, midwest farmers, and suburban housewives. While the broad differences between cultures, races, economic strata, age groups, and so on are widely recognized, even by the most enthusiastic advocates of *QOL* quantification, there are some who will admit to no common groupings of *QOL* parameters at all. These champions of the entirely individualistic view of *QOL* argue that each person's view of life is unique and that it is not possible, or acceptable, to compare that person's satisfactions, happiness, achievement, or whatever with anybody else's. In brief, this view holds that any aggregation of *QOL* measures, even if such measures could be obtained, would so totally distort the individual's situation as to make the aggregated measure meaningless.

Apprehension about the statistical approach to establishing *QOL* measures quite properly reflects a concern about the sublimation of the individual to the group, but it overlooks an important point, namely that we, as a nation, do conduct social programs aimed primarily at groups rather than individuals. If we collectively acknowledge that such programs have value, then we may legitimately look for ways to measure their success or failure from the group perspective. Hence any outright rejection of some degree of community in *QOL* factors or parameters must inexorably be coupled with an equally adamant rejection of any group oriented programs, no matter how apparently beneficial they may be.

A second group in the "cannot do it" camp holds the view that, even if a suitable set of common *QOL* factors could be produced, no valid measurements of these factors are obtainable. Even the most optimistic of social indicator research specialists will admit to some reservation on this point. The concern, quite simply, is that *QOL*, being a highly subjective concept involving profound feelings, values, and attitudes, cannot be reduced to quantitative measures. Related concerns focus on the time variability of an individual's *QOL*, both over a lifetime and on a far shorter time scale, and on the fact that the way in which an individual weights one *QOL* factor relative to another may depend more on the immediate degree of his satisfaction/gratification than on his overall considered view of priorities. Then there is the widely expressed concern that, even if an individual claims to be offering a carefully reasoned evaluation of his *QOL* situation, he may, in fact, not be articulating his true views at all, but may instead be attempting to offer an "acceptable" response that will please the interviewer. Each of these concerns, and a number of others not yet enumerated, can be treated as raising implicitly a scientific question. In essence they question the feasibility, or even possibility, of developing valid and reliable methods for measuring an individual's *QOL* in a scientific fashion. Fortunately such concerns can, because they are essentially scientific, be answered in principle. Later we shall deal with these matters in more detail when we treat measurement problems.

Among the concerns voiced by those who argue that we "should not" attempt to quantify life quality, two stand out as particularly pervasive. The first is epitomized by the work of Maruyama (1972) who argues that the entire notion of quantifying *quality of life* is inextricably linked with a traditional Western logic system that is being replaced by a new approach stressing the symbiotic rather than the competitive. As a consequence, Maruyama concludes that any attempt to classify and quantify *QOL* factors merely serves to prolong an outdated system, and hence should not be undertaken. This somewhat extreme view is nonetheless representative of concerns expressed frequently, particularly by those who regard *QOL* quantification as philosophically repulsive–an assault on the individual.

The second of the dominant "should not" concerns does not dwell on the philosophical or even the scientific questions associated with *QOL* quantification. Rather it focuses on the kind of harmful use to which a *QOL* index might be put. Such strong fears of the potential for abuse of a *QOL* measure by a large bureaucracy were expressed frequently at the EPA Conference. There is no truly effective counter to these deeply held concerns, though one can argue with some conviction that if a bureaucracy is to act, it is better that it base its actions on some information about the state of society, no matter how incomplete, than on total ignorance.

What has been presented here is a rationale for progressing in an attempt to attach precision and quantitative measures to the *QOL* concept, as well as a highlighting of some concerns, even fears, that are expressed about such a program. Where, then, does all this lead? One can certainly make a strong case for pressing ahead for a very simple but compelling reason. Because the business of trying to define and quantify *QOL* is an intellectual challenge, it will certainly be undertaken (unless of course we enter a period of complete thought suppression). Hence we had best go about it in as systematic and as scientific a way as possible, and with all due dispatch.

3. SOME BASIC ASSUMPTIONS

A comprehensive discussion of all that has been done in the field of social indicator research or on *QOL* quantification is well beyond the scope of this chapter. Furthermore, several excellent reviews of the subject are already available (Dalkey, (1972), Campbell and Converse, (1972), Sheldon and Moore, (1968).) The intent is rather to focus on the ideas presented at the EPA Conference or by conference participants in their contributed papers. In this discussion we will not advocate any particular approach to *QOL* quantification but will present, as clearly as possible, the alternatives that have been suggested at the conference and in literature and the difficulties associated with each of them. In addition we will describe, and comment on, the experiments in *QOL* quantification conducted at the conference.

The first step in any attempt to attach quantitative measures to the *quality of life* concept must necessarily be to establish a rigorous, working definition of what this illusive concept actually means. As the preceding chapters have made abundantly clear, however, even this first step along the road to quantification presents a major hurdle. As Dalkey (1972:85) points out, even the word "quality" can be thought of in two ways: it can refer to a condition or it can imply a degree of excellence. Many authors have avoided the definitional problem altogether by simply listing a series of *QOL* components and defining the concept in terms of its parts. Even this approach can easily lead to controversy, however, There are, for example, differences of opinion on the types of factors that should be included in a *QOL* component list. Some researchers favor inclusion of only those *external*, or *objective*, factors that are amenable to direct measurements; others opt for inclusion of various *internal*, or *subjective*, factors. Later in the discussion we will present a tableau of *QOL* factor lists prepared by various authors to illustrate both the diversity of the components included and their common features.

In order to emphasize the diversity of potential definitions of *QOL*, it is instructive to consider the variety of definitions offered by participants at the EPA conference. A number of researchers have focused on the individual psychological aspects of *QOL*. For instance, Dalkey (1972:58) has defined *QOL* "to mean a person's sense of well-being, his satisfaction or dissatisfaction with life, or his happiness or unhappiness." This kind of definition, although admitting the possibility of the objective indicators* being important to an individual's sense of well-being, tends to elicit more psychologically oriented responses, as evidenced by the list of *QOL* factors developed by Dalkey and Rourke (Dalkey, 1972:60). Mitchell et al (1972:4) have also emphasized the "phenomenological, direct or psychologically oriented (measures) as distinct from the behavioristic, inferential or physiologically oriented (ones)" in defining *QOL* as "an individual's overall perceived satisfaction of his needs over a period of time." These authors point out, quite correctly, that it is possible for an individual to have a nominally high *QOL* as seen from the social indicator viewpoint but to perceive his *QOL* to be low (an example of this phenomenon is seen in the so-called "paradox of affluence").

The apparent difficulties inherent in treating the subjective or psychological aspects of *QOL* in a rigorous, scientific fashion (and we shall return to these problems shortly) have led many researchers to restrict their scope by defining *QOL* in terms of objectively measurable parameters. This point of view was represented at the EPA conference by Hornback and Shaw (1972:4), who defined *QOL* "as a function of the objective conditions appropriate to a selected population and the subjective attitude toward those conditions held by persons in the population." This kind of definition limits consideration to those *QOL* indicators that can in principle be measured in an objective fashion but it admits the necessity of seeking some subjective measures of how people perceive their situation vis a vis these indicators.

Emphasis on objectively measurable parameters has been the hallmark of the "social indicators movement" in *QOL* research. Even within the framework of social indicators research, however, there are various perspectives reflecting different views on the definition of social indicators and how they should be developed. Brooks et al (1972) have summarized this situation very clearly and have identified four principal approaches, viewing social indicators as:

- Instruments for detecting changes in the *QOL* of individuals, groups or societies
- Instruments to monitor progress toward societal goals, thereby reducing the normative implications inherent in the *QOL* concept

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* A widely referenced list of such indicators was proposed in the document "Toward a Social Report", U.S.D.H.E.W., (1969). This list includes: health; social mobility; physical environment; income; public order and safety; learning, science and art; participation and alienation.

- Social statistics, particularly emphasizing the reporting of social statistical series that reflect change in time

- Measures of changes in variables that are components in a social system model, thereby focusing objectively on the performance of social systems/groups

These authors emphasize that any one of the four approaches provides a legitimate framework for conducting meaningful social indicator research. They do, however, express preference for the use of social indicators as parameters in a social system model designed to provide a basis for making effective policy decisions. This approach offers wide horizons for concrete, scientific research while avoiding the definitional morass that accompanies less precise conceptual perspectives.

There is no way to reconcile the divergences of opinion on how to define *QOL*, nor should any attempt be made to do so. The important thing, from the point of view of making scientific progress is that each research effort be based on a carefully conceived definition which is then adhered to rigidly. Sheldon and Freeman (1970) state that it is the "conceptual needs (in *QOL* research) which are greatest–what to measure and what are valid operational measures of critical phenomena." In order to meet these conceptual needs, however, it is necessary to begin research programs with clear directions. That some research teams are focusing on objective *QOL* measures and others on subjective measures is not at the present stage particularly critical. In time the outputs of both efforts will meld into one, more comprehensive, understanding of the *QOL* concept.

Once a precise definitional framework has been established for proceeding with research on *QOL* quantification, the next step is to develop a series of hypotheses that can be tested scientifically. If we keep emphasizing the scientific approach to the problem, it is for good reason. Without a reasoned, logical approach to answering well-posed questions, it is not possible to make any real progress at all. A usual first step after definitions have been established is to make a series of assumptions or constraints to guide the research effort. Such assumptions can limit the scope of the problem. In order to simplify it, they can provide classification guidelines, and so on. To illustrate, it is appropriate to comment briefly on some assumptions that have been made in the research efforts reported at the EPA conference.

The approach taken by Dalkey (1972:9), for example, is based on two assumptions:

- That "the basic components of *QOL* are common to practically all individuals, and are only weakly dependent on ethnic or socio-economic status"

- That "differences between individuals in (their) relative emphasis on (various *QOL* components) are due in large part to the fact that tradeoffs among the components are dependent on how much the individual is receiving of each."

One might disagree with these hypotheses (in particular the first one is not, as we have noted earlier, widely accepted) but at least they have the virtue of being amenable to scientific testing.

A slightly different set of assumptions, or definitional constraints, might require that any *QOL* quantification scheme:

- Apply to all individuals
- Specify points about which there is general consensus
- Focus on areas in that individuals have an active personal interest
- Focus on factors that can be influenced by known or conceivable strategies of social organization
- Focus on factors for which there are both objectively and subjectively measurable features and that the objective and subjective measures for a given factor exhibit some consistent correlation
- Consider the necessity of reflecting differences among different people under widely ranging conditions
- Be sensitive to changing societal and physical conditions
- Be open to criticism and to proof or disproof according to recognized scientific criteria

These constraints, though perhaps not universally accepted, are at least consistent with the *QOL* definition proposed by the authors, and they serve to provide strong direction to (and limitation of) the detailed quantification approach.

Mitchell, Logothetti and Kantor (1972:6) also established a series of attributes to be satisfied by any *QOL* quantification procedure. Though very different in character from the constraints just proposed, they satisfy the basic requirement of internal consistency with the *QOL* definition established by Mitchell and his coworkers. These authors suggested that a *QOL* measurement system should:

- Distinguish between various *QOL* levels, each with its special pattern of needs, values, and beliefs
- Be sufficiently general that it apply to a large majority of Americans (we see that this condition is rather widely accepted)
- Be flexible enough to encompass any life style (again, we see that this constraint is essentially universal)
- Be based on subjective definitions of *QOL* (but these interior assessments must reflect the exterior aspects of life, such as social functioning, economic well-being and physiological need)
- Reflect the motion of life—the directionality, expectation, growth and so on—as well as the static aspects of life—history, demography, possession, circumstance experience, and the like

We have noted in this list of attributes two that seem to occur in basically the same form in nearly all the research approaches that have been discussed. This is an important observation because it reflects, already, a tendency toward some universality of approach. The strong subjective emphasis in this work differs strikingly from the more objective orientation of other researchers. However, one may expect that, as knowledge accumulates, the apparent divergences between the objective and subjective approaches will become less pronounced.

Before leaving the subject of definitional constraints or assumptions, it is worth commenting briefly on another class of such assumptions, that dealing with the requirements for a *QOL* component classification scheme. One of the more basic, and widely quoted, sets of classification criteria is that proposed by Ayres (1972). The four principal criteria he suggested are that:

- The classification be unambiguous (i.e., have no overlap of categories)
- All possible cases be covered (i.e., there should be no gaps)
- The number of classes be small enough to manipulate but large enough to permit adequate detail
- Any entity must be homogeneous within a class but differentiate from entities in other categories.

In practice it is almost impossible to devise a classification of *QOL* components that meets all these criteria, but they serve as a useful guide for structuring a classification.

The preceding discussion has dealt at some length with a variety of alternative assumptions and constraints in order to illustrate the kind of careful, logical process that must be followed in developing a *QOL* quantification scheme. We must acknowledge that it is virtually impossible to produce a scheme that is above criticism on philosophical grounds. If the *QOL* researcher is consistent within the scientific framework of definition and assumption he establishes, however, then he will quite likely make a useful contribution to our knowledge about *QOL* quantification, and that must be the main objective at this stage of development of the field.

Establishing working definitions and assumptions is the first step to be taken in beginning a research program on *QOL* quantification, and in our preliminary remarks we have sampled some typical definitional constraints to illustrate the diversity of approaches adopted by various research groups. The next step in the quantification process is to identify the principal elements that must be included. We have already touched on the key points in our earlier discussion. Most researchers agree on the following five basic features:

- *Factors, indicators or components:* Various names are used to describe the categories or characteristics that contribute to overall life quality. One might refer to these elements in more scientific terms as variables.

- *Classifications:* The factors are typically ordered according to a logic that makes sense to the researchers. Some criteria may be invoked to guide this classification, and frequently the classification scheme is fundamental to the method of quantification.

- *Measures:* A set of measures must be obtained to describe each factor or group of factors. These measures may be objective in nature (e.g., air pollution in ppm, number of doctors per unit population) or subjective/attitudinal. Where a series of measures for the same factor is available, some kind of condition on the correlation between these measures may be imposed. One necessary condition is that some type of universal scale be established for each measure.

- *Weights:* It is essential to develop some form of hierarchy of factors in order to compare the measures associated with them. A common way to achieve this relative ranking of factors is to obtain individual weightings from each member of the sample population. Frequently it is difficult to distinguish between the subjective measures and relative weights, and often the distinction is not made formally.

- *Aggregation:* Once specific *QOL* factors have been assigned quantitative measures, it is necessary to obtain a *QOL* index appropriate to each individual in the sample population and then to aggregate the results for a selected group of individuals to obtain an average or effective *QOL* index or measure. It is on this subject of aggregation that one encounters the most disagreement and uncertainty among *QOL* researchers, largely because so little concrete and testable work has been done.

The remainder of the discussion in this chapter will be devoted to a review of some recent attempts to develop a *QOL* quantification scheme and a synopsis of the severe research problems that have been encountered. We will focus on each of the five elements introduced above and will endeavor to point out what may be some useful avenues of research relating to each element. Primarily we will draw on results and opinions presented at the EPA conference on the *QOL* concept. A more thorough review of the available literature on the problem has been conducted by the EPA Fellows and is presented in their recent report (Hornback et al, 1972).

4. SOME PRELIMINARY ATTEMPTS AT *QOL* QUANTIFICATION

Most of the research on *quality of life* that has been done to date has been devoted to the identification of appropriate factors or indicators and to exploring and testing methods for measuring these factors in a valid (that is, correct or meaningful) and reliable (that is, repeatable) way. The state of social research in this field has been admirably summarized in two recent books: *The Human Meaning of Social Change* by Campbell and Converse (1972) and *Studies in the Quality of Life* by Dalkey and coworkers (1972). The work by Campbell and Converse provides a comprehensive statement of the evolving need for new measurement techniques that transcend those characteristic of a social accounting system relying primarily on economic and demographic data. It draws together the most advanced concepts that have evolved during the last decade of research on measuring the state of society. This important research endeavor, known formally by such names as social reporting, social indicator research, and social goals accounting, reflecting the economic models from that the early writers drew their first perspectives,* has now matured to the point where significant effort is being devoted to measuring a broad spectrum of *QOL* factors going far beyond the economic and demographic indicators upon which the initial research was based.* The work by Dalkey, on the other hand, presents a very different approach to *QOL* research, emphasizing the determination and weighting of *QOL* components using the Delphi technique. Delphi has its historical roots in the disciplines of decision theory and technological forecasting but, as clearly demonstrated by Dalkey and his colleagues, it is a technique that has much to recommend it as a tool in *QOL* quantification.

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* See for example Bauer (1966), Gross (1966), and the excellent work by Sheldon and Moore (1968).

It is not the intent of this discussion to repeat or even to summarize these outstanding reviews or any of the others that are available in the social science literature. Instead we shall comment on the ideas presented at the EPA Conference, both in the plenary sessions and in group discussions. Primarily the emphasis at the conference was on establishing a definitional framework for thinking about the *QOL* concept and on developing a preliminary list of components or factors characterizing life quality. Indeed this has been the primary emphasis of professional research on the subject as well.

([illegible]) Factors, Indicators, Components

Every individual when asked to state what is important in determining his *quality of life* will come up with a list of *factors:* good health, adequate income, love, freedom from anxiety and so on. The research problem one faces is, then, to develop a composite list of factors that describe every aspect of *QOL*. As Ayres (1972) properly points out, establishing a factor or component list that is both totally inclusive and yet nonredundant is extremely difficult, particularly so since a wide variety of life styles must be accommodated by such a list. An alternative approach is to abandon the idea of a comprehensive list and develop instead a classificational scheme for *QOL* levels and then attach separate factor lists to each level. This attack has been suggested by a number of authors, most notably Maslow (1954, 1968), and has recently been pursued by Mitchell et al (1972). We will come back to a discussion of this approach shortly but, since the idea of a comprehensive factor list has attracted considerable attention, it is appropriate to look first at the types of factor lists that have been generated.

With only a few exceptions, factor lists have been produced by the "armchair" method–that is, the research team arrives at a consensus as to which factors are important on the basis of, at best, minimal survey research. One such list uses four criteria: (1) that the list should be as comprehensive as possible; (2) that it should not contain any redundancies;

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* An outstanding example of this kind of research is that being conducted by F. Andrews and colleagues in the Urban and Regional Studies Division of The Institute for Survey Research, U. of Mich.

(3) that it should deal with conditions amenable to both objective and subjective measurement; and (4) that it should contain characteristics that are as single-dimensional as possible. The resulting list consists of nearly thirty items grouped under six main component headings:

- Economic Environment
- Political Environment
- Physical Environment
- Social Environment
- Health Environment
- Natural Environment

The authors next compared their factor list with similar lists generated by other research groups, and the result of this comparison is shown in Exhibit A. There are a number of specific points to note about this exhibit. First, the horizontal structure is designed to match items in the ten other factor lists with the six principal component headings given above. It is evident that, despite the apparent differences in the various lists, there is some underlying structure that is common to essentially all of them. Furthermore, when we study the words and phrases used to denote specific factors, we find that the same concepts are emphasized repeatedly, albeit in different language. There are, however, some exceptions to this uniformity trend, and they are listed outside the double-line boundaries on the chart.

The most striking exception to the overall trend is found in the factor list developed by Dalkey and Rourke (1971). Exhibit A gives only a few representative examples from their psychologically oriented list. Because of its importance from a scientific viewpoint, it is appropriate to discuss the research carried out by Dalkey and Rourke in some detail. Instead of relying on the "armchair" method of list generation, these authors made use of a sample population of college students and conducted a three-step survey program based on Delphi techniques:

- The subjects were asked to list from five to ten items that they considered to be most important in determining their *QOL* (biological factors were to be excluded) and then to rank those items. From this initial survey some 48 categories of similar items were generated by a panel of researchers. This factor list is shown in Exhibit B.

- In the second session, the subjects participated in an exercise to reduce the number of distinct items on the factor list by rating the similarity between labels on the initial list of 48. The result of this exercise was a 13-component list, with each component containing a number of related factors.

COMPARISON OF QOL FACTOR LISTS[1]

EPA FELLOWS (1972)	PERLOFF (1969)	MOSS (1968) (IN SHELDON & MOORE, pp 504 5)	COMMUNITY AND ENVIRONMENT ASSESSMENT COMMITTEE (1972)	DALKEY & ROURKE (1971) p. 12	REPORT OF THE WHITE HOUSE CONFERENCE ON YOUTH INDIVIDUALISM (1971)	GROSS & SPRINGER (1967) pp 4 5	WILSON (1972) pp
			PERSON DISSATISFACTION PAST LIFE EVENTS EXPECTED LIFE EVENTS DEMOGRAPHIC VARIABLES (AGE RACE SEX) LABOR FORCE & COMMUNITY PARTICIPATION STATUS EXPECTATION ORGANIZATIONAL **HOUSEHOLD** (3) STATUS INCONGRUITY SOCIAL STATUS INDEX LIFE CYCLE TYPOLOGY DISPOSABLE INCOME TOTAL CONSUMPTION OF GOODS & SERVICES WEALTH	**PSYCHOLOGICAL ASPECTS** FEAR ANXIETY AGGRESSION AMBITION COMPETITION DOMINANCE SUPERIORITY ACQUISITIVENESS COMFORT NOVELTY ETC	**INDIVIDUALISM**	**INDIVIDUAL AND GROUP VALUES** INTENSITY OF COMMITMENT TO PARTICULAR VALUES AND BELIEFS	**INDIVIDUAL STA**
ECONOMIC ENVIRONMENT WORK SATISFACTION INCOME INCOME DISTRIBUTION ECONOMIC SECURITY	**WORK PLACES** SAFETY AMENITIES WORK CHALLENGE	**WELFARE BENEFITS** PUBLIC ASSISTANCE AND RELIEF UNEMPLOYMENT OLD AGE AND RETIREMENT DISABILITY AND PENSION ALLOWANCES	**ECONOMIC** BUSINESS INDICATORS NEIGHBORHOOD MEDIAN INCOME ABSENTEEISM TURNOVER RETAIL SALES COST OF LIVING UNEMPLOYMENT		INCOME & ECONOMIC SECURITY AGGREGATE ECONOMIC ADVANCEMENT PRODUCTIVE EMPLOYMENT AREAS EMPLOYMENT AND PRODUCTIVITY		ECONOMIC GROW WELFARE (2)
POLITICAL ENVIRONMENT INFORMED CONSTITUENCY CIVIL LIBERTIES ELECTORAL PARTICIPATION NON ELECTORAL PARTICIPATION GOVERNMENT RESPONSIVENESS			**POLITICAL GOVERNMENTAL** [illegible] OF MATTERS OF GOVERNMENT OPENNESS TO POWER RESPONSIVENESS TO PUBLIC		JUSTICE FREEDOM LIVING ENVIRONMENT	DISCRIMINATION AGAINST NEGROES CIVIL LIBERTIES THE MASS MEDIA [illegible] DEPTH REPORTING ELECTORAL PARTICIPATION	INDIVIDUAL EQUAL STATE AND LOCAL INFORMED AND CITIZENRY PROFESSIONALISM
PHYSICAL ENVIRONMENT HOUSING TRANSPORTATION MATERIAL QUALITY PUBLIC SERVICES AESTHETICS	**HOUSEHOLD SHELTER** HOUSING CONDITION CROWDING RATS ROACHES OTHER PESTS PLUMBING HOUSEHOLD EQUIPMENT **TRANSPORTATION UTILITIES** TRANSPORTATION WATER SUPPLY SEWERAGE SOLID WASTE DISPOSAL ELECTRICITY GAS TELEPHONE OTHER COMMUNICATION	**HOUSING ENVIRONMENT (4) & UTILITIES** HOUSING (URBAN RENEWAL PUBLIC HOUSING) PHYSICAL ENVIRONMENT (HIGHWAYS WATER UTILITIES)	**HOUSING** TYPE RESIDENTIAL STABILITY DENSITY AVAILABILITY				TECHNOLOGICAL LIVING CONDITIONS E.G. ALLEVIATING POVERTY
SOCIAL ENVIRONMENT COMMUNITY SOCIAL STABILITY CULTURE PHYSICAL SECURITY FAMILY SOCIALIZATION RECREATION	**COMMUNITY NEIGHBORHOOD** COMMUNITY CHARACTERISTICS SERVICES ENVIRONMENT	**REGULATION & SAFETY** **RECREATION & CULTURE** **NATIONAL DEFENSE** **HUMAN RESOURCE DEVELOPMENT** EDUCATION HEALTH	**SOCIAL CULTURAL** SOCIAL DISORDER VALUE CONSENSUS SOCIAL INVOLVEMENT COMMUNICATIONS		GENERAL HEALTH TRAINING EDUCATION AND CULTURE	CRIME AND DELINQUENCY	EDUCATION
HEALTH PHYSICAL MENTAL NOURISHMENT			**POPULATION** BIRTH RATE DEATH RATE				HEALTH (2)
NATURAL ENVIRONMENT AIR QUALITY WATER QUALITY RADIATION SOLID WASTE TOXICITY NOISE	**SPATIAL ENVIRONMENT** UNDERGROUND SPACE UNCOVERED LAND COVERED LAND RADIOSPECTRUM SPACE AIRWAYS SPACE **NATURAL ENVIRONMENT** OPEN SPACE RECREATION AIRSHED WATERSHED QUIET AND NOISE ZONES MICRO CLIMATE ZONES SUNLIGHT EXPOSURE OLFACTORY ZONE	**HOUSING ENVIRONMENT (4) & UTILITIES** AIR CONSERVATION DEVELOPMENT OF RESOURCES	**NATURAL ENVIRONMENT** POLLUTION METEROLOGICAL VARIABLES NATURAL RESOURCE AVAILABILITY		NATURAL ENVIRONMENT	**NATURAL ENVIRONMENT** STREAMS ESTUARIES LAKES AIR ABOVE METRO AREAS SOLID WASTES	
		SPACE **GENERAL GOVERNMENT** GENERAL GOVERNMENT INTERNATIONAL AFFAIRS & FINANCE	**POLITICAL/GOVERNMENTAL** GOVERNMENT FISCAL ACTIVITY **GENERAL SERVICES** SUPPLY DEMAND UTILIZATION **POPULATION** MIGRATION			**URBAN CONDITIONS** INTERNAL MIGRATION EMPLOYMENT DATA SEGREGATION DATA	AGRICULTURE

FOOTNOTES

1. THE 18 SOCIAL GOALS CATEGORIES OF DR N.E. TERLECKYJ (1972) ARE NOT INCLUDED IN THIS CHART TERLECKYJ'S LIST WHILE CORRESPONDING CLOSELY TO THE EPA FACTORS CAME TO OUR ATTENTION WHEN THE FINAL DRAFT OF THIS MANUSCRIPT WAS BEING PREPARED

2. HEALTH AND WELFARE WERE CLASSIFIED BY WILSON TOGETHER AS HEALTH AND WELFARE THEY HAVE BEEN SEPARATED TO PARALLEL THE EPA LIST

3. THE HOUSEHOLD CATEGORY OF THE CEAC MEETING INCLUDES ELEMENTS THAT EPA ECONOMIC ENVIRONMENT SECTOR AND OTHERS THAT PARALLEL NO FACTOR FELLOWS LIST THIS FACT IS INDICATED BY THE POSITIONING OF THE HOUSEHOLD CAT TABLE

A

EXHIBIT A
Comparison of *QOL* Factor Lists

COMPARISON OF QOL FACTOR LISTS[1]

RITY AND ENVIRON ASSESSMENT TTEE (1972)	DALKEY & ROURKE (1971) p. 12	REPORT OF THE WHITE HOUSE CONFERENCE ON YOUTH INDIVIDUALISM (1971)	GROSS & SPRINGER (1967) pp. 4-5	WILSON (1972) pp. 3-4	SAN DIEGO ENVIRONMENTAL DEVELOPMENT AGENCY (1972) p. 53	FLAX (1970) p. 9	OFFICE OF MANAGEMENT & BUDGET (1972)
ACTION PE EVENTS ED LIFE EVENTS RAPHIC VARIABLES (AGE , SEX) FORCE & COMMUNITY TICIPATION EXPECTATION ZATIONAL HOLD (3) INCONGRUITY STATUS INDEX CYCLE TYPOLOGY ABLE INCOME CONSUMPTION OF GOODS & ICES	**PSYCHOLOGICAL ASPECTS** FEAR ANXIETY AGGRESSION AMBITION COMPETITION DOMINANCE SUPERIORITY ACQUISITIVENESS COMFORT NOVELTY ETC	INDIVIDUALISM	INDIVIDUAL AND GROUP VALUES INTENSITY OF COMMITMENT TO PARTICULAR VALUES AND BELIEFS	INDIVIDUAL STATUS			
MIC INDICATORS RHOOD MEDIAN INCOME EISM ER SALES LIVING YMENT		INCOME & ECONOMIC SECURITY AGGREGATE ECONOMIC ADVANCEMENT PRODUCTIVE EMPLOYMENT AREAS EMPLOYMENT AND PRODUCTIVITY		ECONOMIC GROWTH WELFARE (2)		INCOME UNEMPLOYMENT POVERTY	**EMPLOYMENT** WORK ENVIRONMENT AND JOB SATISFACTION EMPLOYMENT OPPORTUNITY **INCOME** LOW INCOME POPULATION INCOME DISTRIBUTION LEVEL OF PERSONAL INCOME
L/GOVERNMENTAL S OF MATTERS IN PMENT S TO POWER VENESS TO PUBLIC		JUSTICE FREEDOM LIVING ENVIRONMENT	DISCRIMINATION AGAINST NEGROES CIVIL LIBERTIES THE MASS MEDIA (APPRAISALS OF DEPTH REPORTING) ELECTORAL PARTICIPATION	INDIVIDUAL EQUALITY STATE AND LOCAL GOVERNMENT INFORMED AND INVOLVED CITIZENRY PROFESSIONALISM		RACIAL EQUALITY COMMUNITY CONCERN CITIZEN PARTICIPATION	
IAL STABILITY LITY				TECHNOLOGICAL CHANGE LIVING CONDITIONS (E.G. ALLEVIATING GENERAL POVERTY)		HOUSING TRANSPORTATION	**HOUSING AND PHYSICAL ENVIRONMENT** HOUSING AND QUALITY OF LIVING CONDITIONS NEIGHBORHOOD QUALITY ENVIRONMENTAL QUALITY
LTURAL ORDER ENSUS VOLVEMENT CATIONS		GENERAL HEALTH TRAINING EDUCATION AND CULTURE	CRIME AND DELINQUENCY	EDUCATION	**SOCIAL/AESTHETIC** HOUSING ADEQUACY VISUAL AND AESTHETIC CHARACTERISTICS PESTS	PUBLIC ORDER EDUCATIONAL ATTAINMENT SOCIAL DISINTEGRATION	**EDUCATION** BASIC SKILLS FOR EVERYONE OPPORTUNITY FOR ADVANCED LEARNING **LEISURE AND RECREATION** TIME AVAILABLE PARTICIPATION **PUBLIC SAFETY/LEGAL JUSTICE** SAFETY OF LIFE AND PROPERTY FROM CRIME EQUITABLE CRIMINAL JUSTICE
				HEALTH (2)		HEALTH MENTAL HEALTH	**HEALTH** LONG LIFE PHYSICAL AND MENTAL WELL BEING
IRONMENT CAL VARIABLES SOURCE LITY		NATURAL ENVIRONMENT	NATURAL ENVIRONMENT STREAMS ESTUARIES LAKES AIR ABOVE METRO AREAS SOLID WASTES		**AIR AND WATER RELATED** AIR QUALITY WATER QUALITY NOISE **MULTI MEDIA RELATED** HAZARDOUS SUBSTANCES SOLID WASTE	AIR QUALITY	
VERNMENTAL FISCAL ACTIVITY VICES			**URBAN CONDITIONS** INTERNAL MIGRATION EMPLOYMENT DATA SEGREGATION DATA	AGRICULTURE	**LAND RELATED** LAND USE/LAND USE SHIFT RECREATIONAL RESOURCES WILDLIFE & NATURAL VEGETATION NATURAL RESOURCE DEPLETION		**POPULATION** POPULATION LIVING ARRANGEMENTS FAMILY STRUCTURE

LFARE WERE CLASSIFIED BY WILSON TOGETHER AS HEALTH AND WELFARE
ARATED TO PARALLEL THE EPA LIST

[3] THE HOUSEHOLD CATEGORY OF THE CEAL MEETING INCLUDES ELEMENTS THAT PARALLEL THE EPA ECONOMIC ENVIRONMENT SECTOR AND OTHERS THAT PARALLEL NO FACTORS IN THE EPA FELLOWS LIST. THIS FACT IS INDICATED BY THE POSITIONING OF THE HOUSEHOLD CATEGORY IN THE TABLE

[4] MOSS CATEGORY HOUSING ENVIRONMENT AND UTILITIES HAS BEEN SPLIT INTO TWO PARTS TO PARALLEL THE EPA FELLOWS LIST OF FACTORS

B

EXHIBIT B
Characteristics of *QOL* Obtained by Dalkey and Rourke [Dalkey (1972)]

1. Fear, anxiety
2. Aggression, violence, hostility
3. Ambition
4. Competition, competitiveness
5. Opportunity, social mobility, luck
6. Dominance, superiority
7. Money, acquisitiveness, material greed
8. Comfort, economic well-being
9. Novelty, change, newness, variety, surprise
10. Honesty, sincerity, truthfulness
11. Tolerance, acceptance of others
12. Status, reputation, recognition, prestige
13. Flattery, positive feedback, reinforcement
14. Spontaneity, impulsive, uninhibited
15. Freedom
16. Communication, interpersonal understanding
17. Loneliness, impersonality
18. Dependence, impotence, helplessness
19. Power, control, independence
20. Good health
21. Failure, defeat, losing
22. Involvement, participation
23. Love, caring, affection
24. Self-respect, self-acceptance, self-satisfaction
25. Self-knowledge, self-awareness, growth
26. Self-confidence, egoism
27. Security
28. Challenge, stimulation
29. Privacy
30. Boredom
31. Escape, fantasy
32. Concern, altruism, consideration
33. Humor, amusing, witty
34. Relaxation, leisure
35. Sex, sexual satisfaction, sexual pleasure
36. Success
37. Achievement accomplishment, job satisfaction
38. Faith, religious awareness
39. Peace of mind, emotional stability, lack of conflict
40. Suffering, pain
41. Stability, familiarity, sense of permanence
42. Individuality
43. Humiliation, belittlement
44. Being needed, feeling of being wanted
45. Conformity
46. Social acceptance, popularity
47. Friendship, companionship
48. Educational, intellectually stimulating

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- The final step involved a relative rating of the 13 *QOL* components using two independent weighting schemes. The results of this exercise are indicated in Exhibit C.

One can certainly argue that the definition of *QOL* used by Dalkey and his coworkers (see our earlier discussion) may well have shaped the kind of responses given by the subjects, focusing their attention primarily on factors influencing their sense of well being–assuming that all the more mundane needs represented by the more conventional social indicators were satisfied. It is an inescapable fact, however, that the Dalkey factor list emphasizes very strongly the subjective, the psychological, the strongly individualist, the emotional aspects of *QOL*. The social indicator movement (and the factors given in Exhibit A are characteristic of that movement) has tended to steer away from such subjective/psychological factors because of the difficulties of saying anything quantitative or precise about them. How, for example, does one establish a "self-respect" measure for a sample population? And even if one could, what meaning does the result have, and can the result be useful in developing social programs to improve *QOL*? When we can give sound answers to such questions, we will have come a long way toward having a clearer understanding of what *factors* to include in a *QOL* quantification scheme and toward having resolved the apparent discrepancy between the factor lists in Exhibit A and that in Exhibit C.

(2) Classifications

We have already considered several classifications of *QOL* factors into a limited set of major components. In fact any list of factors at all represents a certain level of classification because it involves describing aspects of *QOL* by single words or phrases. There are, however, classificational approaches to *QOL* quantification that are more involved than a simple ordering of factors, and it is worth commenting briefly on one such approach proposed by Mitchell et al (1972). The authors focused on the needs, values, and beliefs (NVB's) of individuals (these NVB's are essentially equivalent to *QOL* factors), but they did not restrict themselves to a single set of NVB's for all types of people. Rather they classified individuals according to a hierarchial "level of growth" scale and then identified a distinct set of NVB's or *quality of life* criteria with each level. Mitchell and his coworkers compared human growth schemata developed by a large number of researchers and demonstrated the close parallelism between all of them. They elected to work with Maslow's (1954) five level scale discussed earlier in developing their quantification method. They further classified the NVB's within each growth level into three "quality" components. These components are described by the groups of words

EXHIBIT C
Grouping and Relative Ranking of *QOL* Factors from the Dalkey and Rourke

	Relative Importance
1. Love, caring, affection, communication, interpersonal understanding; friendship, companionship; honesty, sincerity, truthfulness; tolerance, acceptance of others; faith, religious awareness.	15.0
2. Self-respect, self-acceptance, self-satisfaction; self-confidence, egoism; security; stability, familiarity, sense of permanence; self-knowledge, self-awareness, growth.	11.5
3. Peace of mind, emotional stability, lack of conflict; fear, anxiety; suffering, pain; humiliation, belittlement; escape, fantasy.	10.0
4. Sex, sexual satisfaction, sexual pleasure.	9.5
5. Challenge, stimulation; competition, competitiveness; ambition; opportunity, social mobility, luck; educational, intellectual stimulating.	8.0
6. Social acceptance, popularity; needed, feeling of being wanted; loneliness, impersonality; flattering, positive feedback, reinforcement.	8.0
7. Achievement, accomplishment, job satisfaction; success; failure, defeat, losing; money, acquisitiveness, material greed; status, reputation, recognition, prestige.	7.0
8. Individuality; conformity; spontaneity, impulsive, uninhibited; freedom.	6.0
9. Involvement, participation; concern, altruism, consideration.	6.0
10. Comfort, economic well-being, relaxation, leisure; good health.	6.0
11. Novelty, change, newness, variety, surprise; boredom; humorous, amusing, witty.	5.0
12. Dominance, superiority; dependence, impotence, helplessness; aggression, violence, hostility; power, control, independence.	3.5
13. Privacy.	2.0

presented in Exhibit D. The idea of this somewhat complex classification scheme is to establish a framework for identifying need levels and for constructing survey questions that get at these needs in a systematic and reliable way.

EXHIBIT D
Three Types of Quality Levels of Components in *QOL*

EXTERNAL	INTERNAL	MOTION
Objective	Subjective	Directional
Physiological	Psychological	Motion/Development
Substantative	Process	Normative
Observed	Felt	Intended
Position	Action	Guidance
Environmental	Personal	Symbol/Image
Cognitive	Affective	Conative
Things	Relations	Goals
External	Internal	Growth
Physical	Emotional	Vision

The relative complexity of the classification scheme proposed by Mitchell et al (1972) leads inevitably to a somewhat involved quantification method, which we will comment upon shortly. But before leaving the subject of *classification* we should take note of the social modeling scheme proposed by Brooks et al (1972). As currently structured, this model is really little more than a classification approach. The authors seek to construct a model for a Community Ecosystem, and they have divided the full system into four major subsystems, each with a series of basic components, as follows:

- Cultural System
    - Values
    - Knowledge

- Social Organization
    - Religion
    - Politics
    - Family
    - Economy
    - Education

- Population
    - Institutional and Social Patterns
    - Physical and Environmental Characteristics
    - Organic Characteristics
    - Cultural Esthetics

- Environmental System
    - Social
    - Physical

Brooks and his coworkers have explored the detailed taxonomy of each of these subsystems and have sought to establish a series of appropriate (qualitative) indicators for each component. They have not yet developed a detailed approach to attaching valid weights to these indicators, however.

(3) Measures and Weights

The amount of effort that has been devoted to attaching quantitative values to the factors/indicators discussed above is quite limited. Largely this is because no consensus has emerged on what factors are important or on what appropriate measures for them might be and also because the scale of data collection required implies a large-scale research effort that cannot be mounted without substantial support. In talking about quantitative measures for *quality of life* factors we must really deal with two problems: (1) what measures provide a suitable description of the actual state of a *QOL* factor as far as an individual is concerned; and (2) how to construct a reliable scientific procedure for collecting quantitative information about the parameter to be measured.

One fairly simple approach equivalent to the one used by Dalkey (1972:65) is to ask subjects to provide relative rankings of factors using some systematic procedure such as "splitting 100." This may, in fact, be the only acceptable procedure to use when dealing with the purely psychological *QOL* factors. The problem with such an approach is that it does not lend itself particularly well to developing an overall *QOL* index for an individual or to aggregating individual indices to obtain a group *QOL* index.

Another very direct, but not particularly sophisticated, approach to developing objective *QOL* measures is represented by the matrix suggested by Joyce (1972). This matrix, shown in Exhibit E, suggests a series of objective, readily obtainable measures representing the attitudinal, societal, political, economic, and physical aspects of selected *QOL* factors. This set of measures is appealing because of its simplicity, but the defect in the approach (aside from the very small number of factors considered) is that there is no way to determine whether the measures suggested are significant or to learn whether they are in any way correlated with how people perceive their *QOL*.

A quantification scheme that combined the features of both the Dalkey and the Joyce approaches into quantifiable methodology was proposed for the EPA Conference. The essence of the idea can be summarized briefly by stating that for each *QOL* factor and for each individual in the sample population the following four quantities are generated:

- The *objective measure* of the factor for each individual, normalized to a 1-10 scale. When more than one measure is available (e.g., measurements of various pollutant concentrations) a combined measure is developed using a suitable technique (e.g., the CEQ air quality index)

- The *subjective*, or satisfaction, *measure* of the same factor for the same individual, also normalized to a 1-10 scale

- The *correlation* between the objective and subjective measures for the entire population with P members

- The *importance weighting* that the individual attaches to the particular factor, relative to the other factors, on a rank order scale.

Both objective and subjective measures can be converted to a standard 1-10 scale. For the objective measures this involves establishing upper and lower bounds and partitioning the range in an appropriate way. For the subjective measures the self-anchoring ladder scale used by Cantril and Roll (1971) is recommended.

EXHIBIT E

Quality of Life Matrix Developed by Joyce (1972)

Manifestations or Aspects	Measures of the Quality of Life in the Area							
	Accessibility	Law Enforcement	Fire Protection	Health Care	Recreation	Education	Housing and Neighborhood	Income Production
Attitudinal	Modal Preference of Transportation	Juvenile Probations per pop. 20-21	Malicious False Alarms	Inoculable Diseases (under 13)	Vandalism $ per Park Acre	High School Dropout Rates	Elementary School Enrollment	% White Collar Employment
Societal	Traffic Arrests/Total Street Miles	Juvenile Dependencies per pop. age 20-21	Arsons per 100 pop.	Suicides per 100,000 pop..	% pop. for Different Age Groups	Largest Ethnic percentage. % Non-white Enrollment	Elementary School Transiency Rates	% Household with Wives Working
Political	Deficient Select System/ Total Select System Streets	Total Arrests per 100 pop.	Fire Engine Companies per 1000 pop.	% Public Hospital Care	5-yr. Proposed Cap. Improv. Program for Parks and Recreation	Voter Participation Rates	Non-residential Uses on Residential Parcels	% Children 4-5 Yrs. Age on Welfare
Economic	% By-passed Employment Due to Lack of Transportation	Losses Due to Burglary and Robbery	No. of Fires Greater than $1000. Loss	Deaths in 25-44 age Group	Private Recreation Investment per 100 pop.	% of People 25+ Yrs. Completed College	Median Imputed Rent per Median Income	Unemployment Rate
Physical	Median Work Trip Time by Private Transportation.	Part I Felonics per 100 pop.	Structural Fires per 100 Structures	Infant Mortality Rate	No. of Types of Facilities	Median 6th Crude Reading Achievement	% Stand Housing. % lacking Facilities	No. Householders under $1000. per Capita Income

We should consider an alternative quantification scheme suggested by Mitchell et al (1972), that the rigorous research required to generate the objective and subjective measures we have been discussing with confidence has not yet been done. Results that will help to point us in the proper directions are now being obtained by several research groups, but it may be some time before we really know which objective measures are significant and how to obtain meaningful subjective measures.

Earlier we reviewed the classificational scheme proposed by Mitchell and coworkers (1972). The five level personal growth scale used by these authors suggests the need for five separate *QOL* scales. The central idea of the quantification scheme proposed is to construct a questionnaire that samples the NVB concern of individuals at each of the five levels, emphasizing in roughly equal proportion NVB's reflecting the three components presented in Exhibit D. It is, of course, necessary to first determine the growth level appropriate to each individual in the sample by administering a "belief response questionnaire" to each subject.

The responses to the NVB questions are converted to an 0-9 scale, nine representing the highest degree of satisfaction with the particular *QOL* component under consideration and zero the lowest. A composite three-digit score is then generated for each individual:

- The first digit represents the need level (1-5)
- The second digit relates to readiness for change to a new need level (0-9) and is obtained from an average of the NVB scores pertaining to the "motion" component
- The third digit (0-9) relates to perceived satisfaction with the existing need level and is obtained by averaging the NVB scores pertaining to the static "external" and "internal" components (see Exhibit D)

This composite score is constructed in such a way that the numerical value increases as the individual progresses to a higher *QOL* within one of the five need levels and as he moves to higher levels of personal growth. In many respects the method of *QOL* quantification recommended by Mitchell et al (1972) is quite elegant, if somewhat complex. It is, however, intrinsically limited to providing a *QOL* index for an individual (averaging the composite scores for members of a group to obtain an aggregated *QOL* index does not make much sense given the method of constructing the score). It also requires very extensive research effort before all of the required questionnaires and procedures can be validated.

Only limited attention has been given to the problem of how to construct an aggregated *QOL* index for a population group in *QOL* research done to date. A paper by House, (1972) deals with the aggregation problem in abstraction, and it is worth summarizing the approach they suggested. A measure of the *quality of life* can be carried out in a number of ways. *QOL* can consist of a set of measures that attempt to encompass a number of relevant parameters that comprise *QOL* or it can be represented by a single index. There is much to be said on behalf of both approaches; however the need for an operational approach is what is needed most at present.

One may postulate a general form for an aggregated satisfaction indicator defined as follows:

$$I_i = f\left(\frac{\text{Status of Factor}}{\text{Desired Level of Factor}}\right)$$

This formulation asserts that regardless of the factor under consideration both a measurable reflection of its status and a measure that reflects the populace's desired level for the same factor must be taken into account. The initial scale is established by inquiry or well established standards, with a value of 10 assigned to the desired (or optimum) level and numerical values assigned in decreasing order to lower levels of satisfaction. On-going measures of status can be either directly obtained from monitoring data of one sort or another or obtained from a suitable surrogate whose movement correlates highly with the parameter under consideration. The ratio of the status score to the desired level score will then yield a measure of the current performance of the system.

A rationale exists for combining the individual indicators into a *quality of life* index where:

$$\text{QOL} = f(I_1, I_2 \ldots I_n)$$

Together the individual indicators for the factors make up a profile of the *QOL* but not a single number. To convert this profile to a single measure, let us hypothesize what addition or summing up would have to be performed. We shall assume that this additional process is possible through use of a Preference Function.

The Preference Function is a construct, highly theoretical in nature, used to represent a numerical measure of that illusive thing that sociologists call culture. A possible way to actually quantify this concept is suggested by Stuart H. Mann and Richard Hobson (1972) of the Pennsylvania State University, Division of Man-Environment Relations, in a paper entitled *Toward the Development of a Quality of Life Index*. If culture as a learned and inculcated feature of human existence has any meaning, and if the psychologists premise that deeply held beliefs are a part of us and control both our individual and group actions has validity, then this Preference Function should by definition at least be able to be approximated.

The Preference Function can be viewed as a measure of the relative importance; i.e., a weighting (w) of selected features of a society to the members of that society. The concept consists of a relative ranking of the factors that make up the *quality of life* by a randomly chosen sample of the people in a particular society. As theory, it suggests that given the *QOL* factors a randomly selected societal sample would rank them both in order of importance and in terms of their relative value in such a fashion that it should reflect the preferences of the people for the chosen items. The same measure could be used for sub-sectors of the society.

The derivation of this weighting is assumed to be feasible. The specific method used in operationalizing this weighting scheme is not necessary for this discussion. Having derived this weighting of factors we can define the *Quality of Life* Indicator as follows:

$$QOL = \sum_{i=1}^{n} w_i (I_i)$$

Having defined the relationship between individual indicators and *QOL* based on a Preference Function or weighting of Indicators, one must then ask how to allocate resources to improve this *QOL* in an optimum manner. Assume that there exist definable Resource Costs (RC) to allocate for maintenance and improvement of *QOL*. The resources under consideration consist not only of money but of time, power, and other resources at the disposal of the system. In short, it is a function that measures the relative cost to maintain the system at levels that it considers adequate or expenditures that it makes to redress imbalances that it wants to correct. The cost is measured so that it can be defined in terms of raising the level of each indicator by one unit. That is, one has a defining relationship between any $I_{(i)}$ and any $RC_{(i)}$.

For purposes of illustrating resource allocation–to maximize *QOL*–one can select a numerical example utilizing the *QOL* relationship defined in this chapter and make the following assumptions.

- Assume that the *QOL* relationship includes three indicators,

  I_1 - Environmental Indicator

  I_2 - Social/Political Indicator

  I_3 - Economic Indicator

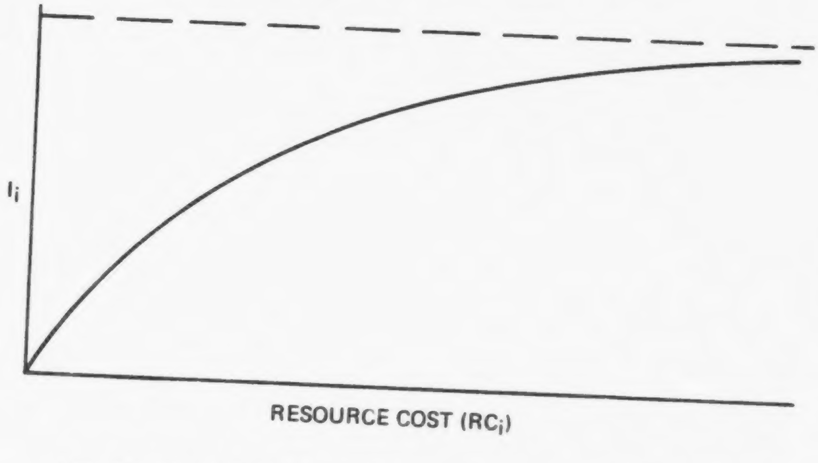
- Assume that a Preference Function; i.e., importance measured by weighting for a culture, has been established for each of the areas defined by these indicators:

  w_1 - Environmental Preference Weighting

  w_2 - Social Preference Weighting

  w_3 - Economic Preference Weighting

- Assume further that there exists a defined functional relationship between the Resource Costs (RC) required to maintain and improve the indicators that constitute the *QOL*. This relationship is assumed to show diminishing returns to expenditures past a certain point. That is, we have relationships as illustrated in the following exhibit.



Note that this relationship will be typically non-linear (i.e., for a fixed amount of resources allocated $\Delta I_i = f(\text{level } I_i)$) and approaches the desired level of I asymptomatically. Note also that we can approximate an incremental change $\Delta I_i / \Delta RC_i$ by a linear ratio or slope.

- Assume that there is available to us 1000 Resource Cost units–900 of which are required to maintain the current level of *QOL*

With the foregoing assumptions one can illustrate a resource allocation scheme to improve *QOL* using quantities. (An example is given in the Appendix.)

The above description of a potentially quantifiable *QOL* indicator allows us not only to define our current system but, if measurement could be implemented, it could give us a powerful tool for forecasting future events. For example, the theoretical structure behind the Preference Function suggests that the society's intrinsic nature is quite stable and that the society will go to some lengths to maintain it. This measure, of course, is subject to change over time but is conceived of as comparatively permanent–usually taking long periods to readjust the societal equilibrium.

On the other hand, it is possible to influence this Function in the short run, say through the media. A concerted effort on the part of the public or private sector to emphasize one or more segments or factors can temporarily rebalance the Preference Function and cause the society to allocate resources accordingly. To the extent that this change becomes imbedded in the society, the Preference Function is actually changed and is no longer temporary. The current interest in the environment is a case in point. It is obvious that the environment and its problems did not suddenly come into being but that the interest evidenced in it recently has come about because of a concerted effort on the part of many groups to make us more aware of the dangers and needs of our physical system. To the extent that those who are most concerned succeed in implanting an "environmental ethic," then the Preference Function will be readjusted to reflect this change in the ethos of the society. If they fail, then the present trend could very well be no more than a fad.

One of the controversial portions of a *QOL* construct is the ability to get meaningful measures of both the subjective and the objective parameters making up the *quality of life*. As noted earlier, much effort has gone into the construction of indicators, and yet work needs to be done both to determine what data is needed on the measurement of the factors selected and on whether the factors and indicators chosen are usefully sensitive to the ideas that are to be measured.

Finally, the concept of cost effectiveness is hard to get at. The idea of the "biggest bang for the buck" is intuitively easy to grasp and is often difficult enough to derive when just economic factors are considered. When other resources are added in, the problem is magnified several times. A promising alternative approach may be to employ a time budget allocation as suggested by Mann and Hobson (1972).

5. RESEARCH NEEDS AND GOALS: THE MAJOR PROBLEMS IN *QOL* QUANTIFICATION

In the preceding pages we have endeavored to give an accurate and reasonably thorough discussion of the ideas concerning *QOL* quantification that were presented at the EPA conference on the *quality of life* concept. One of the principal threads running through all the conference discussions was an emphasis on the major problems one encounters in doing research on *QOL* quantification. Hence, by way of recapitulation, it seems fitting to highlight once again those problems.

The first of these problems occurs at the definitional stage and involves the selection of a suitable perspective and the development of a sufficiently rigorous and precise definition of *QOL*. At the present time, given the enormous diversity of viewpoints we have noted above, there can be no one "correct" perspective or definition; but one can ask of the researcher a degree of consistency between his definitions, his assumptions, and his approach.

Selection of a comprehensive, yet precise and manageable, list of *QOL* factors is, we have noted, one of the principal problems faced by the research community today. The factors to be included must ultimately reflect the views of the people whose *QOL* is being measured. The importance of individual participation in the *QOL* definition and quantification process was repeatedly emphasized at the conference and is certainly not to be overlooked. One approach to solving this problem is to conduct a broadly based social research program aimed at establishing a universal factor list and then to include in the list any factor that is nominated by a significant percentage of the sample population. This approach is similar to that used by Dalkey (1972) on a small scale and in the research programs reviewed by Gordon at the EPA Conference (see Chapter II for a report of this research.)

We have dealt in some detail with the severe problems associated with the selection of appropriate objective and subjective indicators for *QOL* factors and with the actual measurements involved in trying to quantify these indicators. The difficulty, of course, is that the science of *QOL* measurement is so new that it is not yet possible to say with confidence whether a particular measurement is meaningful in the sense that it relates to how individuals perceive their *quality of life*. In fact it is not even clearly established that one can ask people what they think about their own *QOL* and get a meaningful answer. Some researchers believe that the only acceptable approach is to gather data indirectly by observing behavior patterns. The problems of measurement are certain to be the major challenge faced by social researchers in the decade ahead and, if proper support is forthcoming, we can logically expect significant progress to be made.

Even if the problem of measurement can be solved completely, there still remains the problem of how to devise a suitable composite measure or index of the *QOL* for an individual. The suggestion has been made that tests of correlation between multiple indicators for a given factor and between objective and subjective measures for the same factor are essential and perhaps should be included explicitly in any expression for a *QOL* index. One also faces the question of how to attach relative weights to the various factors contributing to *QOL*.

Once a valid and reliable procedure for establishing an individual *QOL* index has been developed, the questions associated with aggregation of the results to form a group index remain to be answered. Aside from the essentially non-scientific question of whether one should aggregate the individual results at all, the social researcher must deal with such concerns as: What level of dilution of the individual *QOL* indices occurs on aggregation? What population characteristics or features (e.g., age, income, race, etc.) define the most suitable classes for aggregation? How large a sample should be used to get meaningful results and can the sample be too large? What are the maximum levels of aggregation, if any, beyond which the aggregated index loses significance?

Obviously there are serious and difficult research problems to be solved before we can introduce into the planning and decision making process a *QOL* index that can be used with confidence. In addition to addressing these problems of perspective, of components/factors, of measurement, and of formulas for indices and aggregation, we cannot lose sight of the necessity for strong policy initiatives on the part of the government to stimulate, support, and guide the major research effort that is required. A clear statement of the need for *QOL* quantification must be made, and it must be made clear to the population that they will have an active role in the process, that their judgment will be called upon, and that mechanisms will be established to unequivocally eliminate any concern they may have that the *QOL* quantification process amounts to government manipulation of their private lives. In addition, it seems essential that the *QOL* researchers and social modelers be permitted ready access to the decision makers and planners who will use their product. The interchange of ideas and the resulting clearer understanding of the needs of both parties will certainly pay handsome dividends in the development of a *QOL* quantification scheme that is both useful to, and used correctly by, the decision maker.

CHAPTER V

AN EXPERIMENT IN *QOL* QUANTIFICATION

One of the main objectives of the EPA Conference on the *QOL* concept, upon which this book reports, was to conduct a series of exploratory experiments dealing with the important aspects of *QOL* quantification: factor list generation, factor weighting and the influence of specific decisions on those weights. Many of the conference participants brought with them profound concerns about the possibility and/or advisability of *QOL* quantification (concerns that have been discussed in some detail in the preceding chapter). As a result, the conference experiment was received with a certain degree of hostility by some participants. Despite the controversy and discord that surrounded the experiment, useful and interesting insights concerning methododogy were obtained. The purpose of this chapter is to review and discuss the *QOL* quantification exercises considered at the symposium.

1. DEVELOPMENT OF A *QOL* FACTOR LIST

The first experiment at the conference called upon the conference attendees to use their judgment to develop a consensus list of *QOL* factors. Because of constraints on time, it was not feasible to generate a list from scratch. Instead, a candidate factor list was prepared by the EPA Environmental Studies Division (ESD) prior to the conference and was used in the experiment as a point of departure. The initial list is reproduced in full here as Exhibit F. It consists of nearly fifty factor items, with accompanying descriptive phrases, grouped under five major *QOL* component headings:

- Natural Environment
- Man-Made Environment
- Social
- Political
- Economic

This list was based on an extensive compilation of similar lists from the literature on *QOL* quantification and was prepared only after a large number of potential *QOL* factors had been carefully considered.

The idea of the initial group experiment was to provide the conference members with the opportunity to modify this list as they saw fit, based on group discussion. Rather than open consideration of the complete list to discussion by the full conference audience of some 150 people, the attendees were split into sub-groups and asked to consider the factors under one of the component headings which contained intentional overlaps. The opportunity to add/delete

EXHIBIT F
Component Factor List

NATURAL ENVIRONMENT

To Delete Place X In Box

☐	Overall Pollution	–	The state of the environment as it relates to all forms of pollution.
☐	Air Pollution	–	The amount of foreign and harmful substances in the air from all possible sources.
☐	Water Pollution	–	The amount of foreign and harmful substances in the water from all possible sources.
☐	Noise Pollution	–	The production of sounds at a level that can be considered annoying and possibly harmful.
☐	Aesthetics	–	The beautiful and/or pleasing aspects of the natural environment.
☐	Land Use Planning	–	The well organized, planned, and presumably beneficial use of the land.
☐	Ecosystem	–	The flourishing of animal and plant life in support of the natural balance.
☐	Radiation	–	The release of radioactive materials into the environment.
☐	Pesticide/Chemical	–	The use of pesticides and chemicals and their subsequent release into the environment.

EXHIBIT F (2)

NATURAL ENVIRONMENT (Continued)

☐ Soil Quality	–	The ability of the soil to support the needs of man as well as animal and plant life.
☐ Solid Waste	–	The problems engendered by the requirements to effectively and permanently dispose of the residual matter remaining after the initial use and/or consumption of society's products.

ADDITIONS

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____________________	____________________
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EXHIBIT F (3)

MAN-MADE ENVIRONMENT

To Delete Place X In Box

☐ Leisure Facilities – The availability of resources (non-personal) for use in leisure activities.

☐ Work Environment – The working conditions consisting of location, physical surrounding, personal relationships, and job status.

☐ Housing – The availability of adequate housing facilities.

☐ Technology – The state of our applied scientific capability as it relates to everyday life.

☐ Aesthetics – The beautiful and/or pleasing aspects of the physical man-made environment.

☐ Transportation – A combination of services and facilities that provide for the mobility of the population.

☐ Material Quality – The capability and reliability of manufactured products.

☐ Utilities – The capabilities, effectiveness, efficiency, and reliability of the utility systems (water, gas, electricity) both public and private.

☐ Physical Structures – The availability and/or condition of offices, factories, public buildings, etc.

ADDITIONS

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EXHIBIT F (4)

SOCIAL

To Delete Place X In Box

☐ Education – The knowledge, skills, character, etc. of the population and the process of obtaining and developing the above by formalized schooling and/or training.

☐ Family Structure – The arrangement or interrelation of the family unit with emphasis on cohesiveness and indivisibility.

☐ Status – One's position, rank, or standing within the societal structure.

☐ Culture – The concepts, habits, skills, arts, instruments, institutions, etc. of a given people in a given period.

☐ Privacy – The ability to withdraw from public view or company; seclusion or secrecy in a given situation; and limitation of use of information concerning a person's background, status, etc.

☐ Safety – Freedom from danger, injury, or damage.

☐ Social Stability – Degree of cohesiveness within a societal structure and between societies; war/peace; absence of riots and other disturbances; law and order.

EXHIBIT F (5)

SOCIAL (Continued)

☐ Personal Skills – Degree of ability, proficiency, or expertise in a given area or areas.

☐ Equality – State or instance of being equal in political, economic, or social rights.

☐ Choices in Life – The change, right, or power to make fundamental choices in life usually by the free exercise of one's judgment and the use of one's resources.

☐ Community – A group of people living in the same area living under the same culture and norms and having interests in common.

☐ Health – Physical and mental well-being. Ability to detect, treat, and control specific causes and characteristic symptoms of illness and ailments. Quality and quantity of services provided in order to maintain mental and physical growth and development.

ADDITIONS

EXHIBIT F (6)

POLITICAL

To Delete Place X In Box

☐ Opportunity Structure	–	A combination of circumstances favorable for and/or offering a good chance or occasion for individual advancement in relationship to ability.
☐ Information Media	–	The freedom, responsibility, and reliability of information sources that are public and/or private.
☐ Democratic Process	–	The acceptance and practice of the principles of equality of rights, opportunity, and treatment.
☐ Civil Liberties	–	Rights guaranteed to the individual by law, such as thinking, speaking, and acting as one likes without interference or restraint except in the interests of the public welfare.
☐ Justice	–	The use of authority and power to uphold what is right, just, or lawful.

ADDITIONS

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EXHIBIT F (7)

ECONOMIC

To Delete Place X In Box

☐ Living Costs	–	That portion of total income required to satisfy basic human needs such as food, clothing, shelter, etc.
☐ Income	–	The money or other gain periodically received by an individual, corporation, etc. for labor, services, or from property investments, operations, etc.
☐ Income Distribution	–	The stratification of incomes in relation to various sections of society.
☐ Consumption	–	The utilization of economic goods or services in the satisfaction of wants or in the process of production.
☐ Economic Security	–	The relative degree to which one is satisfied, secure in his economic state with relation to his needs and requirements for his level of aspiration.
☐ Economic Growth	–	The change over the previous year in total production of goods, total economic activity, total consumption, or total productive capacity.
☐ Labor	–	The quantity and/or quality of the labor force in terms of productive capacity, specialized skills and diversity.

EXHIBIT F (8)

ECONOMIC (Continued)

☐ Capital – The accumulated and concentrated wealth used to finance the creation, operation, and expansion of economic activity.

☐ Investment – The outlay of land, labor, and/or capital to the future production of goods and services.

☐ Public Spending – The amount of current and consumable resources that are channelled through the public sector for either direct redistribution or final consumption by public agencies.

ADDITIONS

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factors from the list was offered, and it was also possible to recommend that a factor be transferred to another component. Each group was assigned a leader and was given an hour and a half to produce a revised factor list. Experience derived from the Dalkey (1972) experiments would suggest that this was ample time for completion of the exercise.

Observation of the groups suggested that the experiment was not particularly successful. Most groups spent a substantial portion of their time in trying to understand precisely what they were supposed to accomplish and in lengthy discussion which was largely undirected and often off the point. Toward the end of the allotted time, most groups made somewhat hasty decisions on modifying their lists and completed the experiment. One group was extremely disorganized and divided, however, and was completely unable to make any decision about the list they were asked to modify. As a result of the difficulties encountered in running the experiment, a revised factor list was developed following the session by the group chairmen. That list is presented in Exhibit G and is the one used in the remainder of the experiments.

It would, of course, be presumptuous, and scientifically untenable, to attach any great significance to this factor list. It was deliberalty generated to provoke debate. There are numerous ambiguities in the definitions of individual factors, and there is even duplication. (The factor *health* appears under two components.) Furthermore, there is no uniformity in the scope of individual factors: Democratic Process and Solid Waste have equal stature in the list. Structurally the final list consists of some 47 factors grouped under three component headings:

- Economic
- Political/ Social
- Environment

The fact that a wide variety of factors was grouped under one super-component, political/social, is a reflection of the difficulties that were encountered in running the experiment and the disagreements that arose and went unresolved.

It is certainly worth commenting on the outcome of the experiment. Largely the difficulties encountered resulted from lack of clarity in presenting the objective of the experiment to the group and from the fact that the sub-group leaders were not very adequately prepared in advance for their roles. One lesson to be learned is that a group experiment of this type must be handled with considerable finesse and be based on meticulous planning.

EXHIBIT G
QOL Factor List

Policy Decision No. ______

ECONOMIC

Accumulated Assets	– The assets owned by an individual in the form of savings, property, insurance, etc.	○
Essential Living Costs	– That portion of total income required to satisfy basic human needs such as food, clothing, shelter, etc.	○
Income	– The money or other gain received by an individual in the form of wages, salaries, tips, dividends, rent, interest, etc.	○
Income Distribution	– The distribution of incomes in relation to various sections of society.	○
Consumption	– The utilization of economic goods or services in the satisfaction of wants.	○
Economic Security	– The degree to which one can maintain his economic state in relation to his needs.	○
Discretionary Income	– The money remaining from the individual's income after essential living costs have been deducted.	○
Capital	– The accumulated and concentrated wealth used to finance the creation, operation, and expansion of economic activity.	○
Investment	– The outlay of land, labor, and/or capital to the future production of goods and services.	○
Rate of Population Growth	– The rate at which the total population is increasing.	○
Economic Opportunity	– Circumstances favorable to improvement of an individual's material welfare in relation to his ability.	○
Economic Development	– Capacity to utilize resources, natural and human, and capital stock to achieve greater and higher quality output.	○

EXHIBIT G (2)

POLITICAL/SOCIAL

Democratic Process	The system by which the public governs itself in accordance with the principles of equality of rights, opportunity, and treatment.	○
Public Participation	The ability of citizens to be heard and to interrogate the decision makers.	○
National Security	The provision and dispersal of military forces and other resources in a manner determined by the democratic process and reasonable public participation.	○
Education	The knowledge, skills, character, etc. of the population and the process of obtaining and developing the above by schooling, training, and other means.	○
Status	One's position, rank, or standing within the societal structure.	○
Culture	The concepts, beliefs, habits, skills, arts, instruments, institutions, etc. of a given people in a given period.	○
Privacy	The ability to withdraw from public view or company; seclusion or secrecy in a given situation, and limitation of use of information concerning a person's background, status, etc.	○
Safety	Freedom from danger, injury, or damage, physical or psychological.	○
Social Stability	Degree of cohesiveness within a societal structure and between societies; war/peace; absence of riots and other disturbances; quality of law and order.	○
Personal Skills	Degree of ability, proficiency or expertise in a given area or areas.	○

EXHIBIT G (3)

POLITICAL/SOCIAL (Continued)

Equality	–	State of instance of being equal in political, economic, legal, or social rights and opportunities.	○
Choices in Life	–	The chance, right, or power to make fundamental choice in life usually by the free exercise of one's judgment and the use of one's resources.	○
Health	–	Physical and mental well-being. Ability to detect, treat, and control specific causes and characteristic symptoms of illness and ailments. Quality and quantity of services provided in order to maintain mental and physical growth and development.	○
Primary Social Relationships	–	Personal, informal relationships of the individual to others within families and other circles of intimates.	○
Secondary Social Relationships	–	Impersonal, formal relations of the individual to others in work and other community environment.	
Use of Free Time	–	Amount of free time alone or in voluntary associations (e.g., church clubs) and variety of activities engaged in.	○

EXHIBIT G (4)

ENVIRONMENT

Air and Water Categories (measures quality and quantity)

Air ○
Water ○
Noise ○
Climate/Weather ○
Hazardous Substances ○

Land Related Categories (measures land shifts and quantities)

Land Use ○
Recreation Resources ○
Ecosystem ○
Natural Resource Depletion ○
Solid Waste ○

Man-Made Categories (measures availability, accessibility, aesthetics and design, product quality, ecological linkage)

Employment ○
Housing ○
Transportation ○
Health ○
Cultural and Spiritual ○
Commercial and Service ○
Utilities ○
Education ○
Leisure ○

2. WEIGHTING OF THE FACTORS

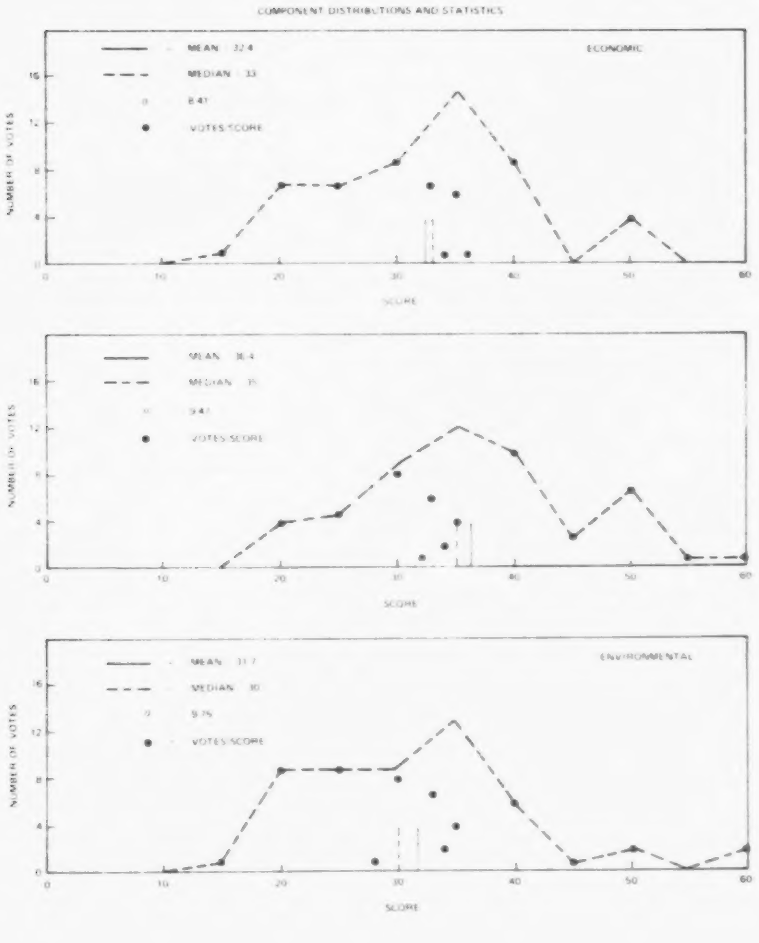
The second experiment in the series was designed to elicit individual judgments from the conference attendees in assigning relative weights to the various *QOL* factors on the revised factor list. In many respects the approach used was similar to that employed successfully by Dalkey and Rourke (1971). The idea was that each individual would make two types of weighting judgments, using the "split 100" technique in both cases. The first was to assign relative weight to the three component groups used in structuring the revised list of factors. The second involved rating the specific factors within each component group relative to each other, again splitting 100 marks among the factors as the individual felt appropriate.

The attempt to introduce this experiment and encourage the conference attendees to participate elicited a surprisingly hostile reaction from a substantial percentage of the group. There were two common themes underlying this dissent: (1) that individuals were (somehow) being "manipulated" by the Federal bureaucracy, and (2) that the quick rating judgments asked for would (somehow) be professionally demeaning and unacceptable, despite the assurances to the contrary offered by Professor Norman Dalkey, based on his own research experience. The discussion of the experiment's validity and of various concerns about its conduct lasted for over an hour and at times became quite heated. In the end some eighty of the conference attendees (slightly over half) agreed to complete the weighting exercise, and their judgments were used in the data analysis that follows.

On balance the apparent breakdown of the formal experiment was probably beneficial to the conference as a whole. The marathon discussion session permitted people to voice their deeply felt concerns about the whole *QOL* quantification enterprise and it provided insight about the care that must be exercised in conducting such an experiment. No doubt the presentation of the experimental approach was cavalier enough to offend the sensibilities of some members of the audience. And quite possibly the admittedly experimental design was too "simplistic" for some. Nonetheless, the experience obtained from the exercise was quite interesting.

In the first step, the participants were asked to divide 100 points among the three component groups (economic, political/social, environment) according to the relative weight they attached to each. The results of this rating are shown in Exhibit H where we plot the distribution of scores and indicate on the graph both the median and mean of the distribution. Because most participants split their votes at five point intervals, we have drawn the distribution to illustrate the accumulated score in every five point span (i.e., all scores between 32.5 and 37.5

EXHIBIT H
Component Distributions and Statistics



are plotted at 35 to show the distribution). The exact number of votes is, however, shown on the graph as they were cast via the bold points. The total number of usable data points is 52. This means that 28 of the original 80 forms returned were unusable for one reason or another (such as incomplete votes of incorrect total votes.) Apparently the voting procedure was not well understood by a large faction of those participating in the experiment.

There are a number of important points to be made about the results shown in Exhibit H. The first is that the distributions are remarkably smooth and reasonably close to normal (in a statistical sense), as shown by the nearly identical value for the median and the mean. The means are all very close to 33, and this implies no very strong differences between the three components. The confidence level for differences between the means is, in fact, sufficiently small that the three components cannot be statistically distinguished as far as relative weight is concerned. Qualitatively, of course, one can note that the political/social component tended to score somewhat higher than the other two.

The ratings for individual factors on the list in Exhibit H were obtained by asking the participants to split 100 votes between the factors under each component. Because the number of factors under economics is smaller than the number under environment, for example, this scoring system tends to weight the economic factors more heavily than it should. To correct for this we must multiply the direct votes by a term that we call the *fractional bias* for the component, which is defined as the number of factors in the component list divided by the total number of factors in the whole list. The fractional biases, f, for the three components are:

f(Economics) = 0.26
f(Political/Social) = 0.34
f(Environment) = 0.40

The next step in the analysis is to weight each factor score with the weight assigned by the individual subject to the component under which the factor falls. Specifically, if we let C_i be the component weighting assigned by individual i to the component and F_i be the appropriately corrected (with f) vote assigned to the particular factor under component C, then the weighted factor score for that individual would be C_iF_i and the average factor score for the group would be

$$\langle W \rangle = \frac{1}{N} \sum_{i}^{N} C_i F_i = \langle C \cdot F \rangle$$

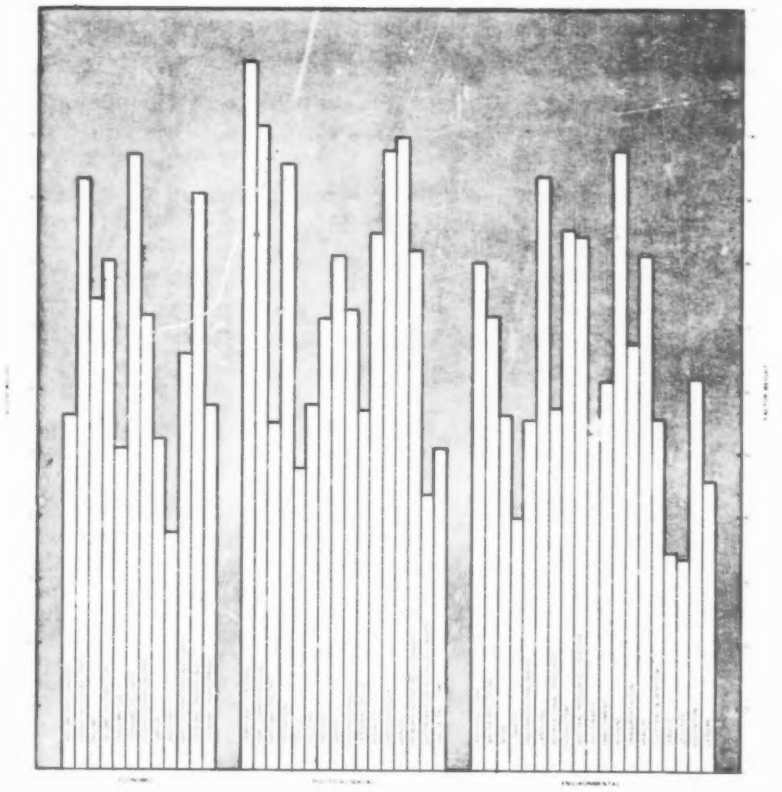
where N is the number of individuals in the sample (that is 52 in the particular case.)

The results of this computation are shown in Exhibit I and they illustrate some very interesting points. The most striking of these is the substantial spread in the weights that the sample population attached to the different factors. Clearly they differentiate strongly between economic security and utility service, to pick two extreme expamples. The 10 most highly weighted factors in order were:

- Democratic Process
- Public Participation
- Health
- Choices in Life
- Housing
- Economic Security
- Education
- Land-Use
- Essential Living Costs
- Economic Opportunity

The eleventh ranked factor was Ecosystem. There are two significant observations, at least, to make about this list: (1) the factors on it are from among the objectively based social indicator types rather than from the class of psychological factors; (2) economic factors were well represented in the top ten list of factors, thus indicating that economic indicators cannot be ignored in developing a representative QOL index. One rather surprising feature of the factor weighting results in the rather low weight given to environmental pollution factors. Housing, Land Use, and Ecosystem are the three most highly rated factors in the Environment component, and the specific pollution factors are far down on the list. This may not be as odd as it first appears. The layman, when he thinks of environmental pollution, does not think of the specific components of environmental pollution (i.e., air pollution, water, noise, pesticide, solid waste) but rather the concept of environmental pollution on a holistic scale. This is substantiated by the results of the experiment. It should be noted that the three component headings are given relatively similar weights (Economic - 31.8, Political/Social - 35.6, Environmental - 31.2), thus leading one to believe that the members tended to equate them almost equally important. In the case of the weighted factor breakdowns, however, many of the environmental factors tend more toward the bottom of the scale. This interesting finding shows that those concerned and working in some aspect of the environment think of the environment not as a total concept but rather as the sum of its parts. This result may also reflect the fact that the participants in the EPA conference, being from a typically high income strata, are not very directly impacted by pollution problems.

EXHIBIT I
Weighted Ratings for *QOL* Factors



3. THE DEPENDENCE OF FACTOR WEIGHTS ON THE DECISION PROCESS

The third step in the experiment run at the conference was to determine if, in the view of the individuals present, particular *QOL* factors would be strongly affected by the implementation of a set of social programs. The following five policy decisions were selected by the Environmental Studies Division as being interesting ones to consider:

- A national policy is instituted that will establish free public mass transit systems in the major metropolitan areas.
- National water standards are established that will require complete recycling of all industrial and municipal water by 1982.
- A national policy is instituted providing a guaranteed minimum annual income of $1,500 per capita.
- A national urban renewal policy is established, and a major effort for implementation is undertaken to provide for the replacement of all slum areas with planned communities consisting of mixed class housing by 1987.
- A national energy policy is adopted requiring the use of low sulphur fuels and atomic energy.

Approximately fifty conferees participated in this phase of the experiment (the remainder joined a discussion on alternative methods of *QOL* quantification), and they were split into groups of ten. Each group considered the effect of one of the national policies on the *quality of life* as viewed from the perspective of residents of a typical American city. If the decision would produce an improvement in the conditions relating to a particular factor, the participants were asked to rank that improvement on a 1 to 10 scale. Alternatively, if the decision would have a negative impact on a *QOL* factor in their judgment, the participants were to indicate that effect on a -1 to -10 scale. No impact at all was noted by marking zero on the scale.

The idea of the experiment was to determine if certain *QOL* factors tended to be strongly influenced (either positively or negatively) by implementing policy decisions. Any such factors would then stand out as particularly important ones to consider before making a major decision or in planning a program.

This third part of the conference experiment went very well in the sense that the participants seemed interested in the problem at hand and enthusiastically discussed the tradeoffs involved. Many of them certainly came away from the experience with a clearer understanding of the kind of problems faced by a decision maker who is attempting to include *QOL* factors as a consideration in his thought process. From an analytical point of view, however, the experiment did not provide particularly useful results. The data obtained had numerous defects (due primarily to lack of clarity in the voting instructions) and did not in the end provide a big enough statistical base to permit any meaningful conclusions to be drawn. In fact, on a qualitative basis, there appeared to be no easily distinguishable group of factors that were impacted more than the others by the decision process. Hence if any conclusion is to be drawn, it is that we must look back to the factor weights themselves for guidance in the decision making process.

In summary, the conference experiment was a useful and informative exercise for the sponsors. Both experimenters and participants found the experience educational. It may be hoped that the lessons learned in conducting this experiment will help to insure that future efforts of this type are more successful and productive of useful information on *QOL* quantification.

CHAPTER VI

THE NEXT STEPS

The *quality of life* concept has evoked considerable discussion and some significant research, and yet the techniques for its practical application to society's decision making processes continue to elude us. There appears to be a clear consensus for the need to develop the concept into a tool for decision makers both in and out of government. If so, what then are the next steps?

1. THE CONFERENCE'S ANSWER

At the EPA conference, a panel discussion addressed the specific question: "What are the next steps to make *QOL* a valid guide for public policy?"

The panel chairman, Alfred Heller, President of California Tomorrow, emphasized the need for developing a set of indicators that would provide the basic ingredients of a "systematic, comprehensive" approach to government planning and policy. He also underlined the need for a *regionally based* approach as opposed to a local, state, or federal system. In the development of such a system, he said, a number of points require clarification. Terms must be defined more precisely. He asked, "Are we seeking measures of happiness or of welfare?" These are quite different things.

To be useful, he noted, measurements must be part of a working economic, social, and political structure. A *QOL* index is of no value without a system of government at the local or regional level that can act to solve problems. In other words, the *QOL* concept, he summarized, should be part of a larger system for social change.

Dr. Mancur Olsen, Professor of Economics at the University of Maryland, noted that two major points of view had been expressed:

- The need for measurement of *QOL*
- The inadequacy of any attempt at aggregate measurement.

He suggests that no single index will be satisfactory or appropriate to everyone. A different *QOL* index for every type of population may be required.

Olsen outlined two major "next steps":

- Develop a pluralistic approach to *QOL* with competing indices reflecting diverse ideologies and values. One overall index could be developed- recognizing its limitations, of course

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- Extend the range of objective measurement. Improve the quality of measures of social welfare or "ill fare". (A social indicator is by definition one that measures a variable to which no market value is attached, he added.)

The basic need, he said, is to get facts and priorities straight, and then apply judgments.

Another panel member, Guy Pauker, Research Associate at Cal Tech's Environmental Quality Laboratory urged that more intensive field research be undertaken to develop *quality of life* measures that are in touch with social reality. He illustrated the point by citing a study in Los Angeles that showed that stray animals, garbage, and noise (in that order) were the primary concerns of ghetto residents. A "ward boss" would have known these "*QOL* issues" in the past. Today, in our more complex, removed system, feedback from people to government is breaking down. "We don't know where the shoe is pinching anymore," he observed.

Pauker believes that we must go beyond polling and use long, unstructured interim and in-depth interviewing techniques to uncover *QOL* values and priorities. He warned of the danger of becoming disconnected from the "real world" in the application of econometric theory.

Loudon Wingo, who is Director of Urban and Regional Studies at Resources for the Future, discussed the need to consider individual differences and intellectual diversities in the development of *QOL* measurement approaches and techniques. He indicated a need to detect "subtle interactions" and "critical links" among *QOL* factors and to examine real world phenomena from a behavioristic perspective as we develop a *QOL* information system to guide public policy.

The general discussion from the floor of the conference was devoted largely to a need to ensure that long-range policy decisions be amenable to change in light of shifting *QOL* values and priorities.

2. RESEARCH NEEDS AND GOALS

One of the principal threads running through all the conference discussions was an emphasis on the major problems to be confronted in future research on *QOL* measurement.

The first of these problems exists at the definitional stage and involves the selection of a suitable perspective and the development of a sufficiently rigorous and precise definition of *QOL*. At the present time, given the enormous diversity of viewpoints noted earlier, there can be no one "correct" perspective or definition, but one can ask of the researcher a degree of consistency between his definitions, his assumptions, and his approach.

Selection of a comprehensive, yet precise and manageable, list of *QOL* factors is one of the principal problems faced by the research community today. The factors to be included must ultimately reflect the views of the people whose *QOL* is being measured. The importance of individual participation in the *QOL* definition and quantification process was repeatedly emphasized at the conference and is certainly not to be overlooked. One approach to solving this problem is to conduct a broadly based social research program aimed at establishing a universal factor list and then to include in the list any factor that is nominated by a significant percentage of the sample population. This approach is similar to that used by Dalkey (1972) on a small scale and in the research programs reviewed by Gordon at the EPA conference (see Chapter II for a report of this research.)

The conference dealt with the severe problems associated with the selection of appropriate objective and subjective indicators for *QOL* factors and with the actual measurements involved in trying to quantify these indicators. The difficulty, of course, is that the science of *QOL* measurement is so new that it is not yet possible to say with confidence whether a particular measurement is meaningful in the sense that it relates to how individuals perceive their *quality of life*. In fact it is not even clearly established that one can ask people what they think about their own *QOL* and get a meaningful answer. Some researchers believe that the only acceptable approach is to gather data indirectly by observing behavior patterns. The problems of measurement are certain to be the major challenge faced by social researchers in the decade ahead and, if proper support is forthcoming, we can logically expect significant progress to be made.

Once a valid and reliable procedure for establishing an individual *QOL* index has been developed, the questions associated with aggregation of the results to form a group index remain to be answered. Aside from the essentially non-scientific question of whether one should aggregate the individual results at all, the social researcher must deal with such concerns as: what level of dilution of the individual *QOL* indices occurs on aggregation? what population characteristics or features (e.g., age, income, race, etc.) define the most suitable classes for aggregation? how large a sample should be used to get meaningful results, and can the sample be too large? what are the maximum levels of aggregation, if any, beyond which the aggregated index loses significance?

Dr. Peter House, moderating an impromptu session, noted that some investigators had abandoned the attempt to measure satisfaction and instead had decided that it was more defensible and easier to measure dissatisfaction. Their logic is based on the belief that happiness is an infinite function and always subject to change as one's aspirations change, even when previous goal is about to be achieved. On the other hand, they felt that it is possible to define thresholds that are at lower bounds of a system and that it is not possible for the system to readjust in the short run. It has been argued that the identification of this lower limit would allow the policy maker to measure the effects of his decisions in terms of how far they move the system away from the dissatisfaction threshold for various population groupings rather than toward an indefinitely changing future objective. None-the-less, there is still a great deal of conceptual work in the "happiness" or satisfaction vein which has potential research payoffs.

Out of the discussion came three possible directions for further research:

- Further work on the pure quantification of measure, not only in defining the factors and the weights but also in statistically manipulating them
- Development of an output vector for large-scale comprehensive models making use of factors used directly by the policy maker or his research staffs
- Development of a methodology that will allow the policy maker to use such a concept as he makes his trade-offs between numerous conflicting resource needs.

Obviously there are serious and difficult research problems to be solved before we can introduce into the planning and decision making process a *QOL* index that can be used with confidence. In addition to addressing these problems of perspective, of components/factors, of measurement, and of forumulas for indices and aggregation, we cannot lose sight of the necessity for strong policy initiatives on the part of the government to stimulate, support, and guide the major research effort that is required. A clear statement of the need for *QOL* quantification must be made, and it must be made clear to the population that they will have an active role in the process, that their judgment will be called upon, and that mechanisms will be established to unequivocally eliminate any concern they may have that the *QOL* quantification process amounts to government manipulation of their private lives. In addition, it seems essential that the *QOL* researchers and social modelers be permitted ready access to the decision makers and planners who will use their product. The interchange of ideas and the resulting clearer understanding of the needs of both parties will certainly pay handsome dividends in the development of a *QOL* quantification scheme that is both useful to and used correctly by the decision maker.

The goal of on-going *QOL* research is a significant one; it is nothing less than to provide society with a tool for determining its values, setting its priorities, and allocating its resources in a way that will serve its rational interest.

APPENDIX

A NUMERICAL RESOURCE ALLOCATION EXAMPLE

- Given indicators of the following values:

  $I_1 = .9$; $I_2 = .4$ and $I_3 = .7$

- Given preference function weightings:

  $w_1 = 50$; $w_2 = 20$ and $w_3 = 30$

- Given Resource Costs (RC_i), the resource costs to raise the I's one percent are obtained from slopes derived from such relationships between I_i and RC_i as depicted in exhibit on page I-59. Assume the following have been so derived:

  $RC_1 = 25$

  $RC_2 = 10$

  $RC_3 = 20$

  The above set of values is summarized below:

$I_1 = .9$	$w_1 = 50$	$RC_1 = 25$
$I_2 = .4$	$w_2 = 30$	$RC_2 = 10$
$I_3 = .7$	$w_3 = 20$	$RC_3 = 20$

Thus:

$$QOL = \sum_{i}^{n} w_i I_i = 50\,(.9) + 30\,(.4) + 20\,(.7) = 71$$

We may allocate 100 units of RC to maximize improvement of *QOL*.

- Allocation of 100 units to I_1 yields ΔQOL of 2.0
- Allocation of 100 units to I_2 yields ΔQOL of 3.0
- Allocation of 100 units to I_3 yields ΔQOL of 1.0

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Our maximum benefit in this case would be allocation of all our resources to the social/political sector. Following such allocation we have:

$$QOL = 50\,(.9) + 30\,(.5) + 20\,(.7) = 74$$

Obviously, the problem just illustrated could be made a great deal more realistic and complex by taking into consideration the changes in the three functions each year; but even here the solution is amenable to standard linear programming techniques. The above examples suffice to indicate the concept.

REFERENCES

Atkinson, Arthur A. and Robinson, Ira M., "The Concept of Amenity Resources," an extract from "Amenity Resources for Urban Living," in Perloff, Harvey S., ed., *The Quality of the Urban Environment,* Resources for the Future: Washington, D.C., 1969.

Ayres, Robert U., "A Material-Process-Product Mode," in Allen V. Kneese and Blair T. Bower, ed., *Environmental Quality Analysis,* Baltimore: Johns Hopkins Press for Resources for the Future, Inc., 1972.

Bauer, Raymond A., ed., *Social Indicators*, The MIT Press: Cambridge, 1966.

Berger, Peter L., *An Invitation to Sociology*, Doubleday and Co.: New York, 1963.

Berger, Peter L. and Berger, Brigitte, *Sociology: A Biographical Approach,* Basic Books, Inc., New York: 1972b.

Boorstin, Daniel J., 'A Case of Hypochondria,' in "The Spirit of '70: Six Historians Reflect on What Ails the American Spirit," *Newsweek,* July 6, 1970, pp. 19-34.

Brookings Institution, *Agenda for the Nation, 1968.*

Brooks, Ralph M., "Toward the Measurement of Social Indicators: Conceptual and Methodological Implications," *Proceedings of the American Statistical Association,* 1971.

Burchard, John, "Some Antidotes for Ugliness," *A.I.A. Journal*, April 1965.

Burchard, John, "The Culture of Urban America," paper given at 50th Anniversary Meeting of American Institute of Planners, February 1968.

Burstein, Samuel M., "Science, Abraham & Ecology," *Intellectual Digest,* October 1972, p. 88.

Campbell, Angus and Converse, Philip, *The Human Meaning of Social Change,* New York: Russell Sage Foundation, 1972.

Cantril, Albert H. and Roll, Charles W., *Hopes and Fears of the American People,* A Potomac Associates Book, New York: Universe Books, 1971, pp. 1-15.

Christakis, Alexander N., "Limits of Systems Analysis of Economic and Social Development Planning," *Ekistics 200*, July 1972a, pp. 37-42.

Commoner, Barry, "Motherhood in Stockholm," *Harpers*, June 1972, pp. 49-54.

Conference Board Record, of May 1971, pp. 20-21.

Dalkey, Norman C., "Quality of Life," unpublished paper by Norman C. Dalkey, March 1968.

Dalkey, Norman C. and Rourke, Daniel L., "The Delphi Procedure and Rating Quality of Life Factors," an extract from "Experimental Assessment of Delphi: Procedures with Group Value Judgments, Rand, 1971.

Dalkey, Norman C., *Studies in the Quality of Life–Delphi & Decision-Making*, D. C. Heath & Co., Lexington, Mass., Rand, 1972.

Gottman, Jean, "The Rising Demand for Urban Amenities," in Sam Bass Warner, Jr., ed., *Planning for a Nation of Cities*, The MIT Press: Cambridge, 1966.

Graves, Clare W., "Levels of Existence: An Open System Theory of Values," *Journal of Humanistic Psychology*, Fall 1970, Vol. 10, No. 2, pp. 13-154.

Gross, Bertram M. and Springer, Michael, "New Goals for Social Information," The Annals of the American Academy of Political and Social Science, "Social Goals and Indicators for American Society," Vol. II, September 1967.

Hornback, K. E.; Guttman, J. M.; Himmelstein, H. L.; Rappaport, A. B.; and Reyma, R., Quality of Life Report–EPA Summer Fellows Program, Washington, 1972.

Hornback, Kenneth E. and Shaw, Robert W., Jr., "Toward a Quantitative Measure of the Quality of Life," paper presented at the Quality of Life Symposium, Environmental Protection Agency, August 1972.

House, Peter; Martin Brossman et al, *"How Do You Know Where You Are Going?"* Seminar in Multiple Criteria Decision-Making, University of South Carolina, October 1972.

Isenberg, Barbara, "Out to Pasture," *The Wall Street Journal*, November 17, 1972.

James, Richard D., "Measuring the Quality of Life," *The Wall Street Journal,* May 18, 1972.

Joyce, Robert E., "Systematic Measurement of the Quality of Urban Life, Prerequisite to Management," California, 1972.

Kamrany, Nate M. and Christakis, Alexander N., *Social Indicators in Perspective,* International Seminar on Ekistics and the Future of Human Settlements, July 1969.

Kenniston, Kenneth, *The Uncommitted,* Harcourt Brace & World: New York, 1965.

Kenniston, Kenneth, *Young Radicals: Notes on Committed Youth*, Harcourt Brace & World, New York, 1968.

Lear, John, "Where Is Society Going: The Search for Landmarks," *Saturday Review,* April 15, 1972.

Lukasiewica, J., "The Ignorance Explosion: A Contribution to the Study of Confrontation of Man with the Complexity of Science-Based Society and Environment," *Transaction New York Academy of Science*, pp. 373-391, submitted January 4, 1971, revision accepted February 28, 1972.

Mann, Stuart H. and Hobson, Richard, "Toward the Development of a Life Index," Pennsylvania State University, 1972 (unpublished).

Maruyama, Margoroh, "Commentaries on the 'Quality of Life' Concept," mimeograph, August 1972.

Maslow, Abraham H., "The Good Life of the Self-Actualizing Person," Kurtz, Paul, ed., *Moral Problems in Contemporary Society: Essays in Humanistic Ethics,* Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1969.

Meadows, Dennis; Meadows, Donella; Randers, Jorgen; and Behrens, William W., III, *The Limits to Growth: A Report for "The Club of Rome's" Project on the Predicament of Mankind,* Universe Books, New York, 1972.

Molitor, Graham T. T., "A Hierarchy of Needs and Values," extracted from "Evolution of Socio-Economic Organization–A Structural Underpinning for Understanding Societal Value," presented before Ad Hoc Interagency Committee on Futures Research, April 20, 1972.

Mondale, Walter F., "Social Indicators as a Method for Forecasting and Planning," presented before the World Future Society Meeting of July 21, 1967.

Mitchell, Arnold; Logothetti, Thomas J.; and Kantor, Robert E., *An Approach to Measuring Quality of Life*, prepared for the Stanford Research Institute, September 1971.

National Goals Research Staff, Report to the President, Washington, D.C., 1970.

Perloff, Harvey S., "Policy Measures for the Environment," extracted from "A Framework for Dealing with Urban Environment: Introductory Statement," in *The Quality of the Urban Environment*, Washington, D.C., Perloff, Harvey S., ed., Resources for the Future, Inc., 1969.

Perloff, Harvey S. and Wingo, Lowdon, Jr., "National Resource Endowment and Regional Economic Growth," in Friedmann, John and Alonso, William, eds., *Regional Development and Planning, A Reader*, The MIT Press, Cambridge, 1964.

Proshansky, Harold M.; Ittelson, William H.; Rivlin, Leanne G., *Environmental Psychology: Man and His Physical Setting*, Holt Rinehart and Winston, Inc., New York, 1970.

Report of the White House Conference on Youth, Washington, D.C., April 1971.

Rokeach, Milton and Parker, Seymour, "Values as Social Indicators of Poverty and Race Relations in America," *The Annals of the Academy of Political and Social Science*, March 1970.

Schmalz, Anton B., et al, "Social Indicators," report to National Science Foundation, New World Systems, July 1972.

Sheldon, Eleanor and Moore, Wilbert E., eds., *Indicators of Social Change*, Russell Sage Foundation, New York, 1968.

Sheldon, Eleanor and Freeman, Howard E., "Notes on Social Indicators: Promises and Potential," *Policy Sciences 1*, 1970.

Singer, Fred S., "Our Environment: Controls and Costs," extracted from *The Conference Board Record*, of May 1971.

Skinner, B. F., *Beyond Freedom and Dignity*, Alfred P. Knopf, New York, 1971.

Solzhenitsyn, Aleksandr, "Truth and the World's Values," from Nobel Prize for Literature acceptance speech, appearing in exerpts in *The Wall Street Journal*, September 6, 1972.

Terleckyj, Nestor, E., "Measuring Possibilities of Social Change," *Looking Ahead*, August 1970.

Toffler, Alvin, *Future Shock*, Random House, New York, 1970.

Wainwright, Loudon, "Won't Anyone Hear the Awful Truth?" *Life*, January 28, 1972, p. 28.

Whitman, Ira L. and staff, *Design of an Environmental Evaluation System*, Battelle Columbus Laboratories, June 1971, pp. 7-10.

Wurster, Catherine Bauer, "Framework for an Urban Society," in *Goals for Americans*, The Report of the President's Commission on National Goals, Prentice-Hall, New York, 1960.

Section 2

"QOL" Anthology

PREFACE

The National Environmental Policy Act mandates the Federal Government to take action:

> ..."in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life"

Improving the *quality of life* has become an increasingly urgent national goal that is commanding the attention not only of environmentalists, but also of economists, sociologists, psychologists, administrators, and others at all levels of government and in many areas of the private sector.

Major programs have been launched to improve the *quality of life* of Americans. A massive commitment of funds has been made in the name of that goal. Daily, governmental decision makers are establishing policy and programs, and allocating resources in ways that significantly impact the *quality of life* of different types of people in different ways.

And yet, the concept that inspires this activity, remains largely undefined. While there is increasing recognition that the concept of *quality of life* involves complex interrelationships and tradeoffs among economic, social, and environmental considerations, the means of dealing with these factors, as yet, elude us.

The Environmental Studies Division, Office of Research and Monitoring, Enviromental Protection Agency is making an effort to improve the tools available to decision makers who are necessarily involved in *quality of life* delivery systems. This effort includes sponsoring a symposium on the subject *The Quality of Life* Concept–A Potential New Tool for Decision Makers. The symposium was held at Airlie House in Warrenton, Virginia on August 29-31, 1972. The objective of the symposium was to explore the *Quality of Life (QOL)* concept, to define *QOL* in terms of its components, and to develop suggested quantitative approaches to its use in guiding public policy.

This anthology which is also part of the EPA effort presents some background perspectives for the consideration of the participants prior to the symposium. The selected readings deal with the *QOL* concept in general as well as from the more specific perspectives of different disciplines–environmental, economic, social, and psychological. The articles represent varying approaches and levels of consideration and were selected to serve both as a general "briefing" for participants and as a review of the literature in the field.

The development of the *quality of life* concept into a form decision makers can use is a necessary part of the effort to carry out the policy declared in the National Environmental Policy Act:

> "to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans"

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THE *QUALITY OF LIFE* CONCEPT
AN ANTHOLOGY OF READINGS

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I DEFINING *QUALITY OF LIFE* MEASURES-THE STATE OF THE ART

DEFINING *QUALITY OF LIFE* MEASURES - THE STATE OF THE ART

The *quality of life* in America has in recent years become the subject of increasing and widespread concern. This concern is being expressed in terms of a number of diverse perspectives. Life style groupings such as affluent youth, ghetto youth, the poor, the feminist movement, the aged, and blue collar workers view *quality of life* in terms of their particular values and life experience. Different disciplines such as economics, sociology, environmental sciences, and psychology--have tended to approach the issue of *quality of life* in terms of their respective characteristic perspectives.

As society attempts to respond to *quality of life* concerns, it confronts the interrelated and often conflicting group values from different interdisciplinary and multidisciplinary approaches.

The *quality of life (QOL)* concept has received increasing attention as the focal point of converging economic, social and environmental considerations. Serious attempts are being made to develop the concept into a useful tool for decision makers in the public and private sectors. This has involved attempts to:

- Define the concept in terms of its constituent components and factors
- Develop indicators to measure the state of each *QOL* component for a given demographic group or geographic entity
- Relate the indicators to relevant quality standards and aggregate them into a single *QOL* index or at least into a set of weighted multiple *QOL* indices, and finally--
- Relate an overall *QOL* concept and *QOL* quantification techniques to the policy and program decisions of government.

This document is an attempt to summarize the current state of the above efforts. The following sections discuss: The history of attempts to define and quantify *quality of life*; the state-of-the-art from the perspectives of different disciplines; and considerations related to varying life styles and socio-economic population groupings. The problems involved in measuring *QOL* are also discussed.

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ATTEMPTS TO DEFINE AND MEASURE *QOL*

For many years, economic indicators such as the Gross National Product and the Consumer Price Index have been the primary measure on "progress" available to decision makers. Increasingly, however, decision makers are being challenged to produce change that improves the *quality of life* in a social as well as an economic sense.

Historically, attempts to define and measure *quality of life* have focused primarily on social indicators. Significant efforts in the field of social indicators date back before 1897 when Emile DurRheim's monumental study, Suicide was published. Later in 1939, E.L. Thorndike in *Your City* used thirty-nine different indicators to produce a "general goodness" index. The index was used to evaluate conditions in a number of American cities.

The concept of social indicators as a tool for social change gained momentum in the late 60's. A growing body of literature opened new channels for discussion and growth in this field. Significant works on the subject appeared in two monographs, *Toward a Social Report,*[1] published by the Department of Health, Education and Welfare in 1969 and later *Toward Social Reporting: Next Step*[2] by Otis Dudley Duncan. These joined other notable works in the literature including: *Social Indicators*[3] edited by Raymond Bauer in 1966; *Social Intelligence for America's Future*[4] edited by Bertram Gross in 1969; and *Indicators of Social Change*[5] edited by Eleanor B. Shelden and Wilber E. Rose. A recent book, *The Human Meaning of Social Change*[6] by Angus Campbell and Phillip Converse has added new insights especially as to the social psychological aspects of the problem.

In an era of urban planning and development, a number of important studies have been conducted in major metropolitan areas regarding the *quality of life* within the urban environment. A recent study undertaken by the Urban Institute of *The Quality of Life* in Metropolitan Washington, D.C. was published in 1970. The study used twelve indicators to make comparisons between eighteen large urban areas.

An ongoing study of New York uses urban, economic, social, environmental and some general indicators to measure the *quality of life.* Major categories for which indicators have been developed on the studies of New York and Washington include:

- Income
- Unemployment
- Poverty
- Housing (costs)
- Education
- Health

- Mental Health
- Environmental Quality
- Public Order/Crime
- Traffic Safety
- Racial Equality
- Community Concern
- Revenue/Taxation
- Welfare and Social Services

These studies were directed at urban decision makers.[7a,b,c].

Another current effort of significance is a two-year study by the Survey Research Center, Institute for Social Research of the University of Michigan. The primary objectives of the study are to develop a valid and efficient way to measure the range of life qualities and to learn something about the key factors contributing to a better life as understood by a representative sample of the American public. The research is supported by the National Science Foundation.

The Michigan team will measure the relevance of a particular concern to an individual, the individual's expectations with regard to that concern, and the individual's conception of change–past, present, and future. The examination of the effect of changing perceptions over time is of considerable importance in arriving at a *quality of life* index useful to government policy–makers.

The National Wildlife Federation has developed an environment quality index which is based on weighted percentage values for seven factors: soil, water, air, living space, minerals, timber and wildlife. An "E.Q. Index" has been published annually since 1969. The E.Q. Index represents an important step towards an inclusive *quality of life* index.

The growing concern in the U.S. for identifying the components and measures of *quality of life* have led to a number of recent conferences. An example was a symposium arranged by Dr. Fred S. Singer of the University of Virginia entitled: Can We Develop An Index for the *Quality of Life*? The symposium addressed the feasibility and methodology of developing an index for *quality of life*. The issues discussed included: the components of *quality of life*; the measurement of identified components; the handling of nonqualifiable components; and the conversion of national income aggregate such as GNP into an index for *quality of life*.

The expanding concern with *quality of life* has led to an increasing interest in the tools of measurement within the U.S. Government. The Office of Management and Budget is currently compiling a document for publication in 1973, tentatively entitled *Social Indicators.* The purpose of the OMB effort is to present available statistics to facilitate an understanding of social conditions and change in the U.S. There is little agreement on one general instrument of measurement. Nevertheless, a consolidation of current information in the field of social indicators is considered useful as a first step in developing the *QOL* concept as a potential new tool for decision makers.

PERSPECTIVES OF DIFFERENT DISCIPLINES

Attempts to measure societal conditions have been undertaken from the standpoint of several major disciplines including economics, sociology, psychology, and the environmental sciences. Each has its own understanding of how values and ideals should be defined and manifested in the laws, norms and sanctions of society. The crucial concern regarding *quality of life* cannot be adequately evaluated, without an understanding of these various values perspectives.

The Economic Perspectives

Since Copernicus and Descares, Western man's thought has tended toward that of a mechanical universe which can be experienced and measured scientifically. Anything which could not be measured scientifically was either ignored or viewed with suspicion. Building upon these thinkers, Bentham created the economic principle of the greatest good for the greatest number, not recognizing that human nature is more complex than the simple summation of pleasures and pains. The most ardent school of positivist economics is identified with Milton Friedman. This view draws a distinct line between positive or purely scientific economics and normative economics concerned with social goals. This school does not consider values to be necessary for any positive analysis of economic questions.

For economists in general, the methodology has emphasized quantity as opposed to quality. The stress has been on technical analysis, concentrating on input-output studies, econometrics, operations research, game theory, and linear or mathematical programming. The knotty problems of human action and behavior have not been addressed to any great extent. Economics has paid little attention until recent times to the fact that such concepts as production and distribution, goods and services, commodities and performances, are related to the human actors who control them and who, in part, are controlled by them.

The concept of economic indicators as instruments for controlling economic fluctuations and maintaining economic growth was nurtured by the depression. Economic prosperity became the major measure of the overall well-being of societies and nations. In *Agenda for the Nations,*[8] the Brookings Institution characterized the trend as: "prosperity as a solvent of social ills has been a chimera–that GNP has turned out to be a small god."

Widespread social unrest and the questioning of the legitimacy of certain traditional institutions stimulated a major reexamination of socio-economic, environmental and behavioral phenomena in other than the economic context.[9]

The Social Perspective

Sociology has provided a number of useful lenses through which the *quality of life* concept may be viewed: class, race, ethnicity, values, matters of "ultimate concern," etc. Many policy analysts and decision makers often forget that their backgrounds as to race, ethnicity, life style, etc.–their value base–greatly influences their "scientific" approach to the development of indicators that will measure the *quality of life.*

The sociologist has brought to our attention the fact that contemporary man is the first to be provided with discretionary leisure time. Is it a blessing or a curse? For those without the resources to engage in the activities they desire, it is often seen as a curse.

We can measure the importance of leisure time by quantifying the leisure time available and the participation levels in various leisure-time activities, but such quantification does not measure resultant levels of satisfaction or well-being.

To generalize, the sociologist can be said to approach the *quality of life* concept from a group, institutional or societal perspective, whereas the psychologist approaches it from the personal or individual perspective. Nonetheless, the sociologist would still have to ask whether we should approach the question, "what is life all about?" collectively or individually. The sociologist also provides a long list of questions directly related to methodologies for measuring the *quality of life*. The sociologist might ask: How do people make sense of and define reality? What "ought to be" (normative) and what "is" (cognitive)? How do religious norms relate to economics? What is the place of motivation? What is the relationship between people's actions and their normative expression? How do differing sets of collective consciousness relate to each other in an overwhelmingly pluralistic society? How does the matrix of norms and interests affect people's behavior, both as citizens and as policy makers/analysts? Is there a balanced view of reality through which a comprehensive explanation of human experience can be made by both individuals and society as a whole? How does one approach the ultimate meaning of human experience with all the subtle complexities of human conduct?

Thus, in attempting to measure the *quality of life*, the sociologist is at the forefront of the development of social indicators which accomplish this measurement. In developing such social indicators, the sociologist must address the fact that society is a community of individual and collective meanings. These must be taken into account and quantified. In the attempt to quantify *quality of life* through social indicators, the results often suffer from confusion between ends and means (or output and input) and the distinction between the two which is often ignored[10].

However, even the term "social indicator" is yet to be fully defined, conceptually or theoretically, although all would agree that it represents some measure of well-being or *quality of life*.

The debate in which sociologists find themselves centers upon whether the demands for social information can be made relevant to public policy decisions. On one side of the debate are those who would use such indicators to help establish social goals and priorities, to evaluate public programs, and to develop a system of social accounts for providing guidance among alternative interventions. The other side of the debate is simply that such cannot be done.

The Psychological Perspective

In *The Human Meaning of Social Change,*[6] Campbell and Converse devote a chapter to "Aspiration, Satisfaction, and Fulfillment." Certainly, these terms convey the full force of the meaning of "quality" for modern life. Campbell and Converse discuss *quality of life* from the standpoint of personal experience, which means frustrations, satisfactions, disappointments, and fulfillment all from the eye of the beholder. They assume that "satisfaction and dissatisfaction are experiences that most people can report with reasonable validity". Campbell goes on to say that, "The revolution of rising expectations will go beyond the demand for better housing and cleaner air to the requirement of a fuller life." But how is this state to be achieved, let alone measured? Campbell does not answer this question.

One of the difficulties in disussing the *quality of life* is that little is known about the relationship between attitudes and behavior. The discipline of psychology addresses this relationship. Many of the methodologies used to explore the relationship between attitudes and behavior involves hierarchy of needs theories. The most famous is that of Abraham Maslow presented in *Motivation and Personality.*[11] Maslow approaches the perspective of individual needs and values with a well developed five level (or stages) "needs hierarchy." The five levels in ascending order are: physiological (or survival); safety/security; social, ego; self-fulfillment (or self-actualization).

A more recent theory is the eight level open ended theory of Clare Graves.[12] For Graves, the turmoil (personal, organization, nation-wise) is due to the transition process of moving from one "need" level to another. A difficulty with the Maslow scale is that at the highest level, self actualization, the theory cannot be applied to organizations–only to individuals. The Graves approach can be applied to both.

Maslow is actually a positivist, for, with the last level, one has "arrived" and there is no more development. Graves, on the other hand, sees the situation in different terms: that growth and development are endless, open, and continuous. Also, with Graves it is not necessary to attempt to achieve the top level. This is important in discussing *quality of life*, aspirations, satisfaction, happiness, etc. The Graves theory, then, becomes not a standard by which one compares oneself in the drive to "the top," but rather a tool to enable people to better manage their relationships with others. The same would apply to organizations, institutions, nations, etc.

A person's or organization's level can be discovered through a series of questions, the answers to which provide the indication of level. The potential ramification of Graves' theory in the area of measuring *quality of life* is enormous.

Because survival needs have been met by the vast majority of the population, it is the higher needs that dominate in our affluent society. This often appears in the frantic search for new goals, heroes, and purposes, with which to, in Toffler's phrase, "cope with the future." Pervading most people's quest for their vision of *quality of life* is a sense of meaning, of individual worth, a feeling that their lives are significant, a sense, therefore, of personal satisfaction and fulfillment, and the knowledge that personal growth can continue.

The Environmental Perspective

The environmental sciences attempt to integrate the knowledge of the physical sciences with the perspectives of economics, sociology, and psychology. The environmentalists attempt to relate the environment and the impact of man-made changes to the *quality of life.*

A number of social concerns can be identified when approaching the environment from the perspective of *quality of life*: the continued support of man by the ecological systems as we know them today; the availability of suitable land, particularly for agricultural and recreational use; and an adequate supply of air and water of suitable quality to support all forms of life. Included in these categories would be wildlife, areas of natural beauty, and recreation areas. It is difficult, given the present state of the art, to interpret these environmental indicators in terms of human welfare.

Certain indicators of ***quality of life*** can be cited as possible beginning points in determining environmental quality in terms of human welfare: the extent of air pollution and the number and percent of persons experiencing air pollution at levels hazardous to health (including the level of pollutants in the air of a given area by type); a comparison of different areas in terms of air quality; the number of polluted bodies of water and the number of persons living within certain radii of the polluted bodies; the numbers of bodies of water and percentage of given rivers and streams in terms of specified pollution levels hazardous to health.

The mandate spelled out by the National Environmental Policy Act not only relates the environment directly to the concept of ***quality of life*** but also provides for the Federal Government to exercise leadership "in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life." In so doing, the Council on Environmental Quality was authorized to "promote the development of indices and monitoring systems...to determine the effectiveness of programs for protecting and enhancing environmental quality." The dependence of man's ***quality of life*** on the quality of the environment is made quite clear in the statement exhorting all levels of government to "promote the general welfare, (and) to create and maintain conditions under which man and nature can exist in productive harmony."

However, without the effort being made to raise the ***quality of life*** of all people, no harmony can be possible between man and environment. People cannot be expected to be concerned about either cultural enrichment or the aesthetic values of their surroundings if their ***quality of life*** does not fulfill the basic needs, wants, and desires for food, shelter and clothing.[7] A wide range of policy issues, both domestic and international, that relate to the environment may well be determined by considerations based on what man considers an adequate level of ***quality of life.*** For instance, a major build up of carbon dioxide in the atmosphere could seriously alter the world's climate by creating a "hot house" effect. Although Americans consider an automobile a part of their ***quality of life***, exporting this ideal of quality to China, with its 800,000,000 people, could be inimical to the ***quality of life*** due to the potential carbon dioxide emissions that would result.

Another consideration involves the food chain. Will the dumping of wastes in the oceans, plus the world-wide distribution of mercury in the various water ways getting into the fish, seriously endanger the biosphere and the eco-cycle? What will be the effect of unrestrained population growth: starvation, disease, catastrophic war? How can we measure, in advance, the potential danger to the environment, and thus to man, of massive oil spills, whether in the oceans, lakes, or northland tundra? How will environment policies which effect: population distribution; conservation of water resources and wilderness areas; use of coastal land areas; wildlife; thermal pollution from moving sources of emission; materials recovery and solid waste management; the use and residue of persistent chemicals, and so on enhance the quality of the environment and in turn the *quality of life* of human beings.

Of vital interest to all concerned with the environment and the preservation of life, is the linkage between certain environmental factors and the factors relating to man's sense of what represents for him *quality of life.*

Joseph L. Fisher, President of Resources for the Future is concerned about the more subjective problems of individual and social welfare that must be taken into account in establishing goals and indicators for environmental quality.[13] He notes that most "environmental–quality indicators" in use in the late sixties were not directly relevant or meaningful for social welfare as most people think of it. He suggests that perhaps the basic indicator for social welfare should be one dealing with "net social benefits" (ie., benefits minus costs or losses in some sense) that would result from selected interrelated measures to achieve acceptable levels of water or air quality. He calls for environmentalists to engage with social statisticians, medical scientists, industrial, agricultural, and sanitary engineers, economists, sociologists, administrators, and others, in research and development on indicators of the various environmental trends regarding pollution and their effect on people.

PERSPECTIVES OF DIFFERENT LIFE STYLES

Each life style grouping whether made distinctive by class, age, interest, economic level, education, or a combination thereof, tends to define *quality of life* in different terms than others. Each has its own value base. Such differences are heightened by demographic and geographic considerations. Add to these life style considerations, the pluralism of American society and the challenge of creating acceptable *quality of life* measures becomes readily apparent. Such diverse interests and viewpoints can best be illustrated by concentrating, for the sake of illustration, upon some of the major categories of class and stage in the life cycle which influence the various definitions of *quality of life.* Such

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NOTE: Thor Hyerdahl stated that in the Ra, not a day passed when they did not have to "battle" the debris they encountered, which was opposite of the experience of crossing in the Kon Ti-Ki 20 years earlier.

categories are discussed in this section and include: youth and the aged; racial and ethnic perspectives; blue collar and white collar workers, the poor and the affluent.

Youth and the Aged

The contrast between youth and the aged in a country that worships youth can be felt in the phrase often used for oldsters: the "unwanted generation." As more and more programs are developed to cater to the young, the elderly are gradually, but continually being devalued and excluded. Youth in the student movements of the West have played increasingly important cultural and political roles, particularly in the past decade (in contrast to the diminishing role played by the elderly.)

The term "youth culture" is a term that has gained currency only during the past decade.[14] Today the term has connotations not only as evidence of the massive opposition of youth to the social-cultural status quo, but also as the harbinger of the future society. These latter views can be seen in such works as Kenneth Keniston's *The Uncommitted,* Theodore Roszak's *The Making of a Counter Culture*, and Charles Reich's *The Greening of America*. Little such attention is paid the elderly.

Yet both groups are remarkably alike. Both groups are at the extremes of the age pyramid, are largely unemployed, introspective, bodies and psyches in greater process of change, and heavy users of drugs. Time is an obsession with both groups. But where youth is worshipped, the aged are avoided. The aged are treated as a "lower class" while youth are treated as an "upper class." After racism and sexism, the latest, rapidly growing "-ism is age-ism.

The implications for social indicators of *quality of life* are significant. We now have the irony of medicine enabling people to live longer at the same time technology has made them non-productive. As this is the first time a society has had to deal with so many aging, there are no models to follow. The work in *quality of life* would differ considerably. Such differences would include such life facets as music, entertainment, clothes, sexual practices, environmental conditions and environmental surroundings available for recreation.

Class, Race and Ethnicity

Two concepts significant to the discussion yet, highly confusing, are those of "class," and "race and ethnicity." Whether one discusses location of various economic housing groupings, educational transportation policies, or quota systems for job hiring and school admission, both concepts are relevant. Of the two concepts, however, class may be more relevant. Parents want their children to live in neighborhoods and go to schools with children of comparable class position. Rightly or wrongly, *quality of life* may be defined in part by parents as being able to shield their children from the social and cultural realities of lower-class life, which the parents may have experienced personally.[15]

Thus, for the different classes, an entirely different set of *quality of life* indicators could be necessary. The cultural differences between groups differing in socioeconomic status (and race) can be discovered by using value choices made in questionnaires given to people of different economic and racial groups. Rokeach and Parker[16] found that differences between the races disappeared when socioeconomic position was the same.

From the above we can speculate that differences between blue collar and white collar workers, between the poor and the affluent, are matters of class and status reflected by economic level. The implications for the complexity and difficulty in designing *quality of life* indicators is clear.

Life-style refers to the overall culture or way of life of different groups in the society. With significant differences existing between the life styles of different classes it is easy to conclude that different strata of people live in different worlds. How *quality of life* can thus be described for each world, particularly from the standpoint of the ability of that world to bring satisfaction and well-being to those within the strata, is a most complex and, to some, disturbing question. How, in measuring the differences in values of each of these life-style classes, (blue collar-white collar, poor-affluent) can diagnoses be made regarding what is right and wrong with American society and, hence, how can the formulation of viable policy alternatives be facilitated effectively and efficiently?

The next question that must be asked, regards the whole matter of whether well-being according to theories of needs hierarchy is to be measured materially or spiritually. Should indicators measuring assets, income, basic services, social mobility, education, political position, and status also measure satisfaction or both? This is a most difficult question facing those who would develop accurate and meaningful social indicators with which they can measure the *quality of life.*

MEASUREMENT OF *QUALITY OF LIFE*

Quality of Life (QOL) is still primarily a rhetorical notion, although it is voiced by a growing number of advocates from a variety of interests and concerns. No one has yet figured out how to measure this most elusive of concepts. The current literature, [17,18,19] however, makes it clear that the notion of *QOL* is deeply imbedded in the body of thought related to social indicators.

Indicators to date have been used almost exclusively for purposes of political or economic assessments and projections. The discussion regarding *quality of life* is concerned in part with how indicators can be developed which will measure the state, conditioning, changes and effects of the thought processes of people.

One of the difficulties in measuring *quality of life* as opposed to economic or production factors, is that there are no "social dollars" flowing throughout the system which can be counted at critical points. The social "system" has vastly different characteristics than the economic system. There are no social costs, prices, incomes, and the like to which most social variables can be converted given the current state of the art.

In considering measurement of *quality of life*, one must continually keep in mind that information and evaluation requirements will change through time. Evaluation criteria will change because values will change and knowledge will expand. Examples will help to clarify these points. The state of knowledge at the 1960 White House Conference on children indicated that children's welfare was enhanced most if the mother devoted full time to them. Thus, welfare policy directed aid toward mothers who remained home, penalizing mothers who were employed. This was more than a matter of economics. It was an attempt to encourage the single mother not to work. In 1972 we see a complete change: now the emphasis is being placed on day care centers so that mothers can work and not be home with their children.

The subjective and objective conditions of *quality of life* measures must be recognized and dealt with. By definition, objective conditions are empirical and reproducible. Heads can be counted or absolute scales can be applied. Census data and economic indicators deal with the objective. *Quality of life* indicators, on the other hand, may go beyond this and include the subjective. Subjective conditions of factors are not reproducible with certainty. They must measure feelings and attitudes. They must indicate the conditions and conditioning or "states of mind" of society and its citizens.

Quantitative methods can be used to determine the normative character of such information. For instance, averages, medians, modes, etc., through all the measure of central tendency, can be applied to determine how typical an attitude or value is among a given population or "universe." However, comparison of an attitude or value held by one person with respect to a different attitude or value held by someone else may not be valid.

Perhaps the measurement problem will not be eased until a grand theoretical structure is completed, utilizing not a multidisciplinary approach but an inter-disciplinary approach. Necessary, however, is the condition of getting those representing the various disciplines to complement each other. The anthropologist is needed to provide solid cross-cultural pre-suppositions to the underpinnings of the exercise. The psychologist, usually more willing to tackle all-inclusive theories, is needed for his adventurousness. The sociologist is needed to apply his special imagination to the handling of ordinal and nominal data; the economist is needed too, for who is more at home with sophisticated model building and the use of mathematical techniques? The historian's adept extraction of the subtleties of meaning and the broader implications from textual material is needed. Political scientists are needed to provide a better understanding of the relationship between research and action. To truly grasp the handles on measuring *quality of life*, the contributions and benefits of the various disciplines must be recognized and utilized.

REFERENCES

1 U.S. Department of Health, Education, and Welfare. *Toward a Social Report.* U.S. Government Printing Office: Washington, D.C., January 1969.

2. Duncan, Otis Dudley. *Toward Social Reporting:* Next Steps. New York: Russell Sage Foundation, 1969.

3. Bauer, Raymond A. (Ed.)*Social Indicators.* Cambridge: MIT Press, 1966.

4. Gross, Bertram, *Social Intelligence for America's Future.* New Jersey: Allynn and Bacon, Inc., 1969.

5. Sheldon, Eleanor and Wilbert E. Moore (Editors). *Indicators of Social Change.* New York: Russell Sage Foundation, 1968.

6. Campbell, Angus and Philip Conversee *The Human Meaning of Social Change.* New York: Russell Sage Foundation, 1972.

7a. Research Analysis Corporation. *Environmental Quality Index–A Feasibility Study.* County of San Diego, Environmental Development Agency San Diego, California, June 1972.

7b. Berenyi, John (Ed.). *The Quality of Life in Urban America–New York City: A Regional and National Comparative Analysis.*

7c. Jones, Martin V. and Michael J. Flax. *The Quality of Life in Metropolitan Washington, D.C.–Some Statistical Benchmarks.* The Urban Institute, Washington, D.C., March 1970.

8. The Brookings Institution. *Agenda for the Nation.* 1968.

9. Kamrany, Nake M. and Alexander N. Christakis. *Social Indicators in Perspective,* International Seminar on Ekistics and the Future of Human Settlements, July 1969.

10. Terleckyj, Nestor E., "Measuring Possibilities of Social Change". *Looking Ahead,* August 1970.

11. Maslow, Abraham H. (Ed.) *Motivation and Personality.* Harper-Row, New York, 1970.

12. Graves, Clare W., W. I. Huntley, and Douglas B. La Bier. "Personality Structure and Perceptual Readiness: An Investigation of Their Relationship to Hypothesized Levels of Human Existence," mimeographed paper, May 1965.

13. Fisher, Joseph L. "The Natural Environment" *The Annals of the American Academy of Political and Social Science,* May 1967.

14. Berger, Peter L. and Brigette Berger. Sociology: *A Biographical Approach,* Basic Books, Inc. New York.

15. Berger, Peter L. and Brigette Berger. "The Assault on Class" *World View,* June 1972.

16. Rokeach, Milton and Seymour Parker. "Values as Social Indicators of Poverty and Race Relations in America", *The Annals of the Academy of Political and Social Science,* March 1970.

17. Mitchell, Arnold, Thomas J. Logothetti, and Robert E. Kantor. *An Approach to Measuring Quality of Life,* Stanford Research Institute, Menlo Park, California, September 1971.

18. Corning, Pater A. *An Index for the Quality of Life.* Paper presented at the 138th meeting of the American Association for the Advancement of Science. December 1971.

19. Joyce, Robert E. "Systematic Measurement of the Quality of Urban Life, Prerequisite to Management", from *Seminar on Management of the City,* Research Analysis Corporation, May 1971, pp. 69-86.

II THE *QUALITY OF LIFE* CONCEPT

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PROBING POLICY–RELEVANT QUESTIONS ON THE *QUALITY OF LIFE*

Some preliminary Research Ideas

By

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1971

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PROBING POLICY–RELEVANT QUESTIONS ON THE *QUALITY OF LIFE*

Some Preliminary Research Ideas

Kenneth W. Terhune, Ph.D.

During the last few years, governmental and citizen concern about the quality of American life has spawned a number of studies on how to measure that quality, to facilitate better reporting of where we are, better planning of where we should go, and better evaluation of what programs have accomplished. Attention has been given on the one hand to developing "hard" statistical indications of things like health and crime, and on the other hand to identifying and measuring, through survey studies, the qualities of life that concern people. Yet important problems remain to be examined if this new onslaught of measurement is to really facilitate the ends toward which it is directed. The studies suggested here would address a few of those problems.

The premise on which the studies are based is that *quality of life* refers to human experience, and the criteria of *quality of life* are those dimensions of life by which people experience levels of satisfaction - dissatisfaction (pleasure-pain, happiness-unhappiness, etc.). The conscious expression of those criteria we designate as human values, so understanding the *quality of life* requires an understanding of the nature of human values.*

In the following pages we briefly describe *four studies relating to quality of life.* The first three comprise a package that examines how our values govern our overall experience of the *quality of life*. Study 1 concentrates on developing a general measure of the experience of *quality of life* in communities. Study 2 examines the nature of community values with respect to issues of considerable policy relevance. Study 3 develops and tests a model on how value experiences determine the net experience of *quality of life*, and thus provides a crucial test of validity of our understanding of *quality of life*. Finally, Study 4 examines the role of *quality of life* in migration decisions within this country, a problem of contemporary interest in demographers and policy makers.

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* The relevance of values to quality of life seems to be commonly recognized now, although the nomenclature sometimes gets messy with reference to "values and needs", "values and goals", and the like. We shall not use additional concepts until they appear necessary to make important distinctions.

STUDY 1

MEASURING THE GLOBAL *QUALITY OF LIFE* EXPERIENCE

Concepts of "the *quality of life,*" "well-being," "social progress," all convey the idea that in some way our life experiences aggregate to a net effect. If they do not, then it makes no sense to say that any group of people is "better off" or "worse off" than another, or that our society has gotten "better" or "worse" over time. Our feelings clearly fly against such a view, and no one seems to raise the matter as a serious issue. Nevertheless, one finds statements that a global measure of *quality of life* is impossible, or at least not to be achieved in the foreseeable future.* Such statements seem to be based on the notion that a global measure would be obtained only by learning how to combine measures of the separate components of *quality of life*. Errors in the procedure could produce misleading results, possibly with disastrous policy consequences. The problem becomes more tractable, however, if we seek not a *composite* measure but a *direct* global measure of *quality of life* as *experienced*. Instead of trying to combine externally evaluated criteria like level of health, amount of income, extent of recreation and so on we develop indicators that reflect well-being through expressed feelings and expressive behavior. That is the objective of Study 1.

Before giving details of the approach, let's consider the potential uses of a global measure of the *quality of life* experience. Some are as follows:

1. *Evaluating programs*–Some programs like Model Cities have the general goal of improving the *quality of life*, but evaluation is more likely to be piecemeal, project by project. It would be a valuable contribution to evaluation if the question could be answered: "Did our program succeed in making people happier?"

2. *Identifying "pockets of misery"*–Just as a person's sickness may not become apparent until it reaches advanced stage, so also the fact that people are disturbed in some neighborhoods or cities may not be apparent for a long time, especially if the response is apathy or lethargy rather than something dramatic like a riot or an epidemic. By signaling that "something's wrong" in an area, steps to determine the problems would be prompted.

3. *Studying quality of life components*–Using the general measure of *quality of life* experience as a criterion or dependent variable, research can assess

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* For example, the Federal government's *Toward A Social Report* states: "Thus the goal of a grand and cosmic measure of all forms or aspects of welfare must be dismissed as impractical, for the present at any rate". (p. 99).

the contribution of any presumed component of *quality of life* to that dependent variable. The relative importance among different components might be examined in that way. More generally, any model on how *quality of life* dimensions combine to determine overall *quality of life* experience can be tested against the criterion measure. (Such an approach will be used in Study 3.)

Since the method we propose is based on expression of feelings by people, it might be asked whether people's expression of how they feel can be assumed to reflect the *quality of life* they are experiencing. Some evidence on this is available. A recent study by Norman Bradburn of the National Opinion Research Center asked the simple question: "Taken altogether, how would you say things are these days–would you say you are very happy, pretty happy, or not too happy?" The proportion responding "not too happy" was considerably greater among

unemployed men (34%) than among the employed (about 8%)

in Detroit's inner city (25%) than in a Detroit suburb (5%)

the indigent (15-23%) than among the affluent (6-8%).

If we may assume that the unemployed, inner city residents, and the indigent experience a lower *quality of life* than the comparison groups, then already we have a clue that simple questions about "How happy are you" may be useful for a global indicator. If so, then the following results have interesting implications for what has been happening to the *quality of life* in the United States.*

	"Very happy"	"Not too happy"
1946	39%	9%
1947	38%	4%
1949	43%	12%
1957	35%	11%
1963	32%	16%
1965	30%	17%

Suggestive though such data are, it would be unwise exclusively to rely upon verbal reports, since they are subject to the influence of the way questions are asked and to variations in word interpretations that may occur across time and locations. Consequently, behavioral expressions of well-being also need to be sought.

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* From various polls; would be documented in proposal.

The general procedure in Study 1 would be as follows:

1. *Review ways of assessing felt well-being*–Various sources would be investigated to find ways by which felt well-being is expressed and which may thereby provide bases for measurement. Explored in the review would be: (a) survey questions pertaining to such matters as happiness, satisfaction, worries, etc.; (b) behavioral indices of group morale; (c) behavior of animals that seems to reflect positive affect (such as behavior following reward); (d) human nonverbal communication of effect; (e) behavioral measures of psychological health and illness. The endeavor here would include not only a literature review, but interviews with animal psychologists, clinical psychologists and psychiatrists to learn what people and animals *do* when they "feel good".

The following are examples of the kinds of indicators that would be considered:

a. Mental health indicators: rates of alcoholism, placement in mental institutions, suicide rates, etc.

b. Stress indicators: psychogenic illnesses (ulcer, asthma, etc.): behavior that people exhibit under stress.

c. Unconscious or semi-conscious expressions of affective tone: posture, amount of sleeping, physical activity, frequency of talking, verbal loudness, making noise, laughter, smiling. (One researcher reports distinct differences in the extent of smiling in different sections of the U.S.)

d. Frequency of ostensibly "happy activities"–Partying, dancing, etc.

2. *Evaluate candidate measures*–The various possibilities would be evaluated by the following criteria:

a. Availability of data or ease of collecting same. (Various forms of data collection methods will be considered including interview surveys, content analysis of cultural products, observation techniques, incident recording.)

b. Boundedness within cultures or subcultures. (Preference will be given to behavioral measures whose meaning appears less subject to variation across cultural lines.)

c. Whether the behavior is likely to reflect general feelings or rather to compensate for general feelings. (For example, certain forms of singing express one's unhappiness, while some passive forms of entertainment may be escapist.)

3. *Data collection and analysis*–Through some sort of team judgment process, three or four locations would be selected for exploratory data collection. The locations might be different cities or neighborhoods within a city. Selection would be made of locations which consensus agrees differ considerably in *quality of life*. Data would then be obtained and factor analyses made to determine the dimensions within the data. (The NORC study cited earlier indicated that psychological well-being has two independent components, positive and negative effect, i.e., absence of happiness is not necessarily misery. We would want to be aware of such indications in the data.) From the results, the best indicators of experienced *quality of life* would be selected.

The study would best be done over two years, with tasks (1) and (2) in the first year. The first year's effort would be carried on by the principal investigator and a graduate assistant at an estimated total cost of $30,000. Since the approach to be used in Task (3) will depend upon the outcome of the first two tasks, a cost estimate for the second year is more difficult. Assuming that survey research would be required, the second year's costs are roughly estimated at $100,000.

A THEORETICAL–AND RELEVANT–POSTSCRIPT ON STUDY 1

The interpretation should not be made that we believe that if environmental qualities remain constant, the experience of *quality of life* also remains constant. People do adapt to their circumstances, so what one considers the "good life" at one time may be thought to be mediocre a decade or so later, even if the social-physical environment has remained constant. (Thus, recollections of "the good old days" may be memories of one's earlier *feelings* rather than of one's earlier actual circumstances.) Hence, the global experience of *quality of life* would reflect not so much static qualities of the environment, but the dynamic ones. To make this clear, suppose one's feeling of the good life is enhanced by having natural beauty in the environment and by having regular exposure to the performing arts. Our hypothesis is that the feeling of a good life would be sustained by repeated "good happenings" in the performing arts, but if the beautiful environment remained constant, it would lose its appeal with a consequent reduction in the experienced *quality of life*. For a feeling of high *quality of life* over a long period, either constant improvement in the social-physical environment is necessary, or a succession of pleasant events must continue. Similarly, a continuous feeling of low *quality of life* requires either steady decrements in environmental qualities or a succession of "bad events".

These considerations are necessary for the realization of what a measure of the *quality of life* experience would and would not reflect, and more generally, for the way that various social indicators to measure *quality of life* may relate to how people feel. Social indicators that reveal the dynamic qualities of the environment are more likely to relate to people's feelings than are indicators that do not reflect the nature of change over time.

STUDY 2

QUALITY OF LIFE: ITS MEANING IN A PLURALISTIC SOCIETY

Policy makers hoping to improve *quality of life* in a community and social scientists trying to measure social progress (improvement in *quality of life*) both must cope with the fact that *quality of life* and social progress mean different things to different people. Unfortunately, especially for the policy maker, this is not an area that is subject to debate or to the reaching of consensus,* for the experience of *quality of life* is a very personal thing; one is not easily persuaded that he likes what he dislikes or the reverse. In other words, people's values or value priorities do differ, and, like tastes, it's difficult to dispute values. This surely challenges the policy maker's art of compromising (or optimizing), while the social assessor is left with the very sticky question of whether social progress can be measured at all, except by one set of value standards which of necessity must be arbitrarily chosen. We doubt that either of these problems is subject to cleancut solutions, but we do suggest here some research that may reveal some order in the diversity of values, the understanding of which would make the problems of the policy maker and social assessor more tractable. It is important to note that the suggested research is neither clearly basic nor applied, for it endeavors to construct part of a bridge between theory and practice with respect to *quality of life*. This is an area where we believe it particularly true, as the psychologist Kurt Lewin once said, "There is nothing so practical as a good theory." If our theory** is correct, there *is* some order among the values of different people and different eras, so that there is some basis for agreement on what *quality of life* is about, and there *is* a basis for measuring social progress from more than a very narrow viewpoint. That is what this study is intended to show, within the context of the concrete values by which people evaluate life in communities.

Our use of the term "value" merits a brief statement at this point. We conceive people as experiencing satisfaction-dissatisfaction with aspects of life according to various criteria, and those criteria we call values. Values may be broad and abstract, e.g., beauty, security, or concrete and relevant to particular domains, e.g., visual beauty of the physical environment, security from crime in one's community. Concrete values pertaining to one's community we call "community values". Associated with any value (for a particular person) is a range of satisfaction. Thus, the range of satisfaction-dissatisfaction between a beautiful and ugly city may be rather limited for a given individual, yet he may experience a wide range of satisfaction-dissatisfaction in an income range from wealth to poverty.

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* This is not always realized, hence we see occasional discussions on what *quality of life* is all about. Even the federal government's *Toward a Social Report* seems to presume that enlightened men can agree on what the *quality of life* is, in an absolute sense.

** Actually, the theory incorporates seminal conceptions of other theorists, especially Abraham Maslow.

To describe the approach very briefly, we shall present questions that we consider important to policy makers and social assessors, following each question with the relevant theoretical question and a short explanation. After that ideas will be sketched for an interview survey that would address the theoretical questions.

Applied question No. 1: On what basis should resources be allocated for the improvement of society?

Underlying theoretical question: How are people's values ordered by importance?

Several studies show that people can give a rank order of importance for their values. Before leaping to the conclusion that policy priorities can be set simply by referring to the most typical or "average" rank order, it should be recognized that what such orders mean is not at all clear. We suggest that different orders will be produced according to whether people are asked to place things in the order by which they would be willing to give them up or in the order of the satisfaction yielded by each. That expectation derives from our theory. If supported by research, the results will indicate what priorities are dictated as necessities and which additional priorities derive as amenities.

Applied question No. 2: For what objectives can we consider alternatives and for which can we not?

Underlying theoretical question: What things are valued for themselves and which are valued only as means to ends?

When people express their value preferences, they most likely will make no distinctions between things that are intrinsically desirable to them and things desired as means to ends. Extant surveys apparently ignore this consideration, which is crucial for policy making. Ends are not substitutable, hence are not things for which policy makers should consider alternatives in seeking to improve *quality of life* in a community. On the other hand, values which refer to means (instrumental values) are easily yielded to other means.

Applied question No. 3: Is there a reasonable sequence by which we should seek improvement of different aspects of our community?

Underlying theoretical question: What values are related contingently, such that A is not desired until B is attained to some degree?

"People are never satisfied; as soon as they get one thing, they want something else." This bit of folklore seems valid and is incorporated into at least one psychological theory. That theory further states, however, that there is a *certain order* by which new wants appear. If true, then a valid theory would help policy planning by forecasting further public demands. (Put another way, it would help policy makers to avoid the erroneous conclusion that because the public doesn't want something today, it won't want it tomorrow.) Projects could be logically phased according to the order by which values are likely to be emphasized.

Applied question No. 4: How can we measure social progress when our very criteria of progress vary among people and change with time?

Underlying theoretical question: Is there an evolutionary character to the emergence of values?

One of the most crucial considerations in efforts to measure social well-being and progress is the fact that the yardsticks themselves are subject to evolution and development. Thus is raised the challenging question: If yesterday's standards are different from today's, is it sensible or possible to assess whether we are "better off" today than yesterday? Or must we be content with just showing differences? Now to be sure, some values like health seem eternally valid. Yet the research of Milton Rokeach indicates that as people become more prosperous, prosperity itself is downgraded as a value while wisdom is elevated. Theories such as Abraham Maslow's suggest that values don't just "change", but rather "higher" values emerge as "lower" ones are satisfied. If this be the case, it is important that any measures of "progress" not be assessing *quality of life* by outgrown standards. At the same time, however, it is essential to discriminate the emergence of *new* values to prominence, as the result of progression, from the re-emergence of *former* values as a result of regression. Man adapts, and it is quite possible that he can adapt to a lower *quality of life*, as is the concern of some environmentalists who fear that we will become adjusted to, hence satisfied with, a deteriorated physical environment.

If value systems are subject to evolution, it is quite possible—as Rokeach's findings possibly suggest—that part of the contemporary diversity in value preferences results from different people being at different levels of value development. Such order in diversity not only would be an important theoretical discovery, but it would facilitate flexible ordering of governmental priorities for validity tomorrow as well as today. Values that are dominant only among a minority today may be shown to herald the majority values tomorrow. (At the same time, we should be sensitive to the possibility of there being several alternative evolutionary paths in value development. If so, this would facilitate the forecasting of future value diversity.)

To be sure, the problem outlined is a profound one, and we have modest expectations of what may be learned in a single study. But the problem is an important one to social assessment efforts and we think the contribution of an initial study could be quite significant. Since we would like to determine whether our methods will produce results to answer the questions we have raised, we suggest a feasibility study within one metropolitan area. The Buffalo metropolitan area has a wide range of qualitative variations, so it would provide a useful testing ground for the methods proposed.

The study would involve survey research, with field work implemented through the Survey Research Center of the State University of New York at Buffalo. Interview questions would be designed, in consultation with the staff at the Center, to elicit the following information.

1. *Perceived characteristics of "best" and "worst" communities*–The objectives here are to reveal the criteria that people use in evaluating *quality of life* in communities, and to gain perspective on means-end relationships. Using an approach similar to that used by Hadley Cantril in his *Patterns of Human Concerns* study, respondents would be asked the characteristics of the best community they could imagine, and the worst. For every characteristic named, they would be asked "Why is that good (or bad)?" Without leading the respondent towards any specific values, these questions would indicate the community values that are important to the respondent, with importance related not only to levels of satisfaction but to dissatisfaction as well. The "why" question would reveal, partially at least, perceived means-ends relationships.

2. *Range of satisfaction of community values*–The objective here is to probe the felt importance of various community values, as indicated by the maximum satisfaction expected if the value were fully realized. Since the method requires a list of values to be established in advance, the values examined will be obtained from a review of the literature on *quality of life*, with selection of those values which seem to be the important contemporary ones. (We would also want to take advantage of the findings of currently ongoing studies, such as the NSF-sponsored study on the *quality of life* at Michigan's Institute for Social Research.) Respondents would be asked to poll the community values first according to the most satisfaction or pleasure they would gain from them, and second by their willingness to give up each of the values. From these results the "satisfaction range" of each value would be readily obtained. The results should clearly portray the relative importance of values, in that most important would be the essential or near essential values (those which people feel they can't or are unwilling to give up), followed by those values which give the most satisfaction.

3. *Progressive steps of community improvement*—The objective here is to learn how value priorities evolve as communities improve. The hypothesis is that value differences among social groups in a community will be systematically related to the *quality of life* these groups experience. One way to test this would be to ask survey respondents to specify a neighborhood in their community where people are somewhat better off, another where people are somewhat worse off, and similarly they would specify the best and worst neighborhoods in their community. Choices would be made from a map of the community in which neighborhoods are delineated. From the responses it should be possible to establish a rank order of neighborhoods, if there is an internal consistency among the respondents sampled. (Note that the method does not require any respondent to be familiar with all neighborhoods of the community.) By comparing the value results from parts 1 and 2 among residents of the successively improving neighborhoods, perspective would be provided on the evolutionary character of community values. (It is recognized, however, that this approach does not directly study the evolution of values, for it is not time-longitudinal). Should it be possible without creating an unduly long interview, it would also be useful to include questions to find the values by which people judge the other neighborhoods more and less preferable than their own. The values mentioned should reveal a progressive shift in moving from lower to higher quality neighborhoods.

Alternate ways of assessing value evolution to be considered for a proposal would include a comparison of different age groups, beginning with youth. While some value change may reflect aging rather than evolution, there is substantial evidence now that indicates that values are fairly stable over time within the individual, but genuinely generational (age-cohort) differences do develop. A third alternative is perhaps the most promising, but difficult to explain in a few words. The respondents would be asked to rank order a set of community values in order of personal importance and also to rate their own neighborhood on how it stands on each of the values. If our general hypothesis above is correct, then it should be possible to develop an array in which neighborhoods are ordered by *quality of life* and values are ordered by the sequences in which they emerge.

The various methods we have discussed for Study 2 are of course tentative, and there are theoretical and methodological questions we would wish to consider in the development of a proposal. In general, however, the study does seem to be one that would provide insights on *quality of life* that could be very important in the assessment of social progress.

It is estimated that Study 2 would be a one-year project costing about $115,000. This rough estimate is based upon the expected contributions of the principal investigator, a graduate assistant, data analysts, plus the services of the Survey Research Center and social science consultants from the State University.

STUDY 3

A MODEL OF *QUALITY OF LIFE*

Study 3 would develop and test a model as a way of determining whether we adequately comprehend what governs the experience of *quality of life*. Only a brief description will be given for this later study which requires the completion of Studies 1 and 2 to be feasible. It is also assumed that new information on the nature of *quality of life* would be available from other studies.

The basic idea of Study 3 is that (a) if from Study 1 we have successfully developed an index or indices of the global *quality of life* experience, and (b) if we can show significant variations among neighborhoods within cities or among cities with respect to measured *quality of life* experience, then (c) we can use as a measure of our understanding of *quality of life* the proportion of variance in the global measure that we can "account" for through other variables.

Community values–the expressed criteria by which people experience satisfaction with their social-physical environment–may be expected to account in large measure for the *quality of life* experience. For each community value that a person holds he will feel some degree of satisfaction-dissatisfaction with the environment within which he lives. In some way these feelings combine to yield net level of satisfaction with his community. We would develop a model that specifies how the net effect is achieved. This is an ambitious undertaking, yet not infeasible. Something which may greatly facilitate the development will be a similar effort we will be making on an NIH-supported contract regarding family size values. That effort would have been completed by the time we would be ready to work on the *quality of life* model.

Development of a model may seem much more of an academic exercise and little related to planning, policy making, or other activities concerned with doing something about the *quality of life*. Yet model construction would not be just an exercise, for it would indicate how to determine, for any group at a particular time, the relative emphasis to put upon different community values to achieve greatest satisfaction. In other words, a good model would provide guidance on how best to allocate resources (time, money, energy).

STUDY 4

ROLE OF *QUALITY OF LIFE* IN MIGRATION DECISIONS

Suppose as a result of studies on the *quality of life* in various cities and states, there is wide dissemination and publication of those places where "life is best". Would masses of people pack up and move on to these promised lands? The belief that the appeal of the good life is a primary incentive in migration has long been part of American lore, and it has in fact led to fears among Oregonians that the "discovery" of the good life in Oregon will attract unwanted hordes to that state. Migration is not the concern of Oregonians only, for among the problems of population that this country is faced with is the fact that our population is concentrated in a small proportion of our nation's geographical area. Future projections by the government forecast concentration of 71% of our population in 12 megalopoli by the year 2000. No megalopolis is forecast for Oregon, but Oregonians should draw little comfort from that, for the federal government's Center for Population Research acknowledges that we still know very little about determinants of migration, so forecasts can go wrong. Study 4 would aim toward better understanding of this problem by examining the role of *quality of life* and other factors in decisions to migrate within the country.

The study would examine a transactional model, in which the decision of a family to migrate includes perceived *quality of life* as one factor. Specifically, our model would specify the decision to move as a function of:

1. *Quality of life:* the individual's* community values (his evaluative criteria of a community) and his evaluation of particular communities (cities, states) based on those criteria.

2. *The individual's roots in his present community:* independent of one's perceived *quality of life* in one's present community, one establishes ties in the way of friendships, familiarity with the environment (knowing how to cope, get around), developed obligations and commitments, and sentimental attachments.

3. *Moving costs:* financial costs plus the upset and readjustments that are necessary in relocating.

4. *Uncertainties:* the lack of knowledge of what life will be like in the new community.

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* In the case of families, substitute family for individual in the factors cited.

To develop a model, survey research would be used to develop a predictive model. A two-phase study is anticipated. In the first phase recent migrants would be compared with nonmigrants to determine the relative contribution of the above factors. With that information the model would be developed to predict migration decisions, and in a second phase the model would be tested by predicting which families within a sample are most likely to move and to where. That phase would include a follow-up six months to a year later to determine the success of the forecasts.

AN APPROACH TO MEASURING
THE *QUALITY OF LIFE*

Prepared for:

**THE STANFORD RESEARCH INSTITUTE
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By

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I INTRODUCTION

Men have always been concerned with the *quality of life*. Many of man's loftiest artistic achievements have sought to describe, or to picture, or to intimate a sense of what is highest in life's qualities. Philosophers and religious leaders have specified the paths to eternal bliss; poets and mystics have hinted at the elements of earthly paradise; visionaries have outlined the principles of utopia; science fiction writers have fantasized the technologies that will lead to unending happiness, and so on and on. Other groups have been more concerned with defining, measuring, or controlling *quality of life*. Thus economists invented the hypothetical "economic man" and hence inferentially defined *quality of life* in terms of material well being. Political economists and reformers going back several millennia have sought to identify *quality of life* with panaceas inherent in political schemes, special types of living arrangem[illegible]s, certain philosophies, specified interpersonal relationships; some even devis[illegible] units and mathematics to measure quality. Historians, sociologists, and a few anthropologists have written on the quality of society, sometimes seeking to identify the "universals" that underlie cultures. Others have set forth various laws of societal evolution. Psychologists and psychiatrists have offered great numbers of schemata of human development, observations on the nature of mental health and illness, and commentary on what constitutes the good life. Very recently the sociological literature has been intensely concerned with the allied fields of social indicators, social goals, social accounts, futurism, systems theory, social engineering, and the like. Studies in these fields have tended to focus on the quality of societal functioning.

The purpose of the present paper is to build on the insights of those concerned with quality life and of society–whether artist, mystic, scholar, observer, or activist–in order to set forth a conceptual approach to measuring *quality of life (QOL)* in the United States of the 1970s. There are many reasons for wanting to develop *quality of life* measures. For example, they are central to assessments of many aspects of social progress and social accounting. They would have much utility in research on national goals, program evaluations, priority rankings, and public and private policy decision-making. Insights drawn from *QOL* analyses should be useful in studies of the future, in understanding societal change, in designing strategies for societal transitions, and in constructing national and international social data systems.

This study is concerned wholly with the principles underlying assessments of *quality of life*. The myriad technical problems inherent in opinion and attitude measurements receive little explicit attention at this stage. Similarly, the study is a necessary first step in dealing with social indicators. If subsequent field work should show that *quality of life* can indeed be gauged as proposed here, it might then be possible to ferret out indicators for the various aspects of *quality of life* and thus contribute to the social indicators movement. The final chapter deals briefly with this possibility. In Appendix A may be found definitions of many of the terms used in this report and in contemporary literature in the field of social indicators.

Sheldon and Freeman (34) have summarized their sense of what is most needed in the domain of societal measurements: "While technical problems should not be brushed aside and the craft in the field needs improvement, it should be emphasized that the conceptual needs are the greatest–what to measure and what are valid operational measures of critical phenomena." This report, being very much an interim document, deals almost exclusively with aspects of the "what to measure" part of the problem.

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II ON DEFINING *QUALITY OF LIFE*

A. General Definition

By *quality of life* we mean an individual's overall perceived satisfaction of his needs over a period of time. This kind of definition differs radically from those based principally on external measures and from those dealing chiefly with societal functioning. The prime distinction is that the proposed measure is phenomenological, direct, and psychologically oriented as distinct from behavioristic, inferential, and physiologically oriented. It seems entirely possible, for example, that a person well situated with respect to the indicator areas* suggested in the Olson report (38) or those suggested by numerous other commentators (e.g., 2,7,8,43,44) could suffer a low subjectively felt *QOL*. Thus a societal system that provides for the basic wants of citizens is perhaps necessary, but is certainly not a sufficient condition for high *QOL*. National goals have stated repeatedly (9) that democratic societies exist to serve the individuals comprising the society. Hence a logical starting point in assessing *QOL* is the individual rather than the system. For this reason, we have turned to the psychological literature in search of ways to measure life's qualities.

B. Roles of NVBs

The basic premise underlying the approach is that what people need, value, and believe (NVB) are the dominating determinants of their sense of *quality of life*. That is to say that *QOL* is highly subjective, especially in its loftier reaches.

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* Health; social mobility; physical environment; income; public order and safety; learning, science, and art; participation and alienation.

As has often been pointed out, it matters more how a person feels about his situation than how his status, measured in some "objective" way, compares with others. This approach thus seeks to reflect a person's inner evaluations–his sense of the discrepancy between what is and what his needs, values, and beliefs lead him to anticipate. The current phenomenon of widespread alienation is a case in point. Many of those most alienated are highly advantaged in economic terms; the source of their alienation is a misfit between their NVB pattern–their sense of what comes first, what image to follow, what are the ultimates in human life–and that of the society at large. Thus NVBs can be thought of as a person's defining paradigm, as the crucial components of his outlook on life. NVBs, indeed, are so fundamental to human affairs that they provide a powerful and useful way of studying societies and institutions, of formulating policies, of forecasting, and so on. This is particularly true in so-called advanced societies able to provide most of their citizens with the essentials for physical existence. Freed from perpetual and central concern with physiological matters, such populations can afford to be guided by the "higher" values and beliefs–they can do things because they believe it is good to do those things, or merely because those things are valued for whimsical, or simple pleasure, or moral reasons. In short, *quality of life* for most citizens of the affluent society no longer is a matter of *mere* physical comfort and well-being, but, rather, depends critically on a person's sense that his deeply held values and beliefs are also being fulfilled. We are, in effect, seeking to measure the interpretation one puts on life–its meaning rather than its exterior attributes or actions.

C. Attributes of *QOL* Measures

Ideally, any system of measurement should include several attributes not always embodied in *QOL* concepts:

- It should distinguish between various levels of *quality of life*, each level having its own special pattern of needs and values and beliefs.

- It should be sufficiently universal that the principles would hold for the large majority of Americans in the U.S. today.

- It should be individual in the sense that it could provide room for any mode of life or any view of man–that is, the measures should be flexible enough to encompass any life style.

- It should be based on subjective definitions of *QOL* but these "interior" assessments must reflect or interplay with such "exterior" aspects of life as societal functioning, economic well being, and physiological need.

- It should reflect the *motion* of life–the aspects of directionality, expectation, developmental surge, image-seeking, growth-orientation–as well as the more static components–the aspects of history, demography, possessions, circumstance, or experience, whether interior or exterior or both.

D. A Basic Schema

The literature dealing with psychological development seemed the most logical place to seek out clues to measuring *QOL* defined in our terms.

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V EXTENSION OF *QOL* WORK

A. Field Testing

Clearly, the first requirement in extending the suggested approaches to identifying need levels and to measuring *QOLs* within the levels is to explore ways in which the approaches can be made operational. This is certainly a major undertaking involving extensive field work.

Many technical problems relating to questionnaire design, clustering, variances, replicability, sampling, and many more will have to be solved. A particularly knotty problem derives from the presumed dependence of *QOL* ratings measured as suggested here upon the societal context. An individual's assessment of a given set of *QOL* factors presumably would be different in times of depression than in times of prosperity, in times of war than in times of peace, and so on. The degree of such fluctuation–the influence of what might be called the "societal shadow"–will have to be explored for each of the major NVB groups. Such fluctuations are probably related to a person's sense of the marginal utility of various *QOL* factors under different circumstances. Conceivably it would be possible to build into the *QOL* score a systematic weighting that will compensate for changed levels of satisfaction with *QOL* clients resulting from changed societal conditions. The problem, of course, might also be handled by concocting *QOL* questionnaires specific to a variety of social contexts.

Recent anthropological approaches employing techniques in which respondents frame their own questions and then answer them–followed by structural and content analysis–should be explored if the approach outlined here does not work out. Undoubtedly, other techniques should also be examined if the proposed *QOL* scales prove unworkable or unwieldy.

B. Additional Measures

In working out operational *QOL* scales, explicit attention might be paid to incorporating three additional aspects of *QOL* (in addition to need level, readiness for NVB change, and satisfaction index in a Maslovian mode). These are:

1. Expectation measures
2. Frequency of satisfaction measures
3. Measures of the "porosity" of the individual/society interface

Expectation measures should enhance *QOL* assessments because, in some basic sense, *QOL* is calibrated against expectations and not "reality". A person whose expectations are on the rise probably tends to be in a euphoric state. If, as a result of unrealistically high expectations, downward corrections are required, a state of depression tends to result. Associated with expectations are planning activities, which might provide good measures of this general area, especially as it relates to the more materialistic, external aspects of *QOL*. (It will be noted that Item 5 in each *QOL* scale utilizes expectations as part of readiness for change). It might, for example, be possible to use the ratio of long-range to short-range actions as an expectation measure, at least for levels 2, 3, and 4.

Data on frequency of satisfaction (or attempts to satisfy) of the needs centrally associated with the various need levels might help provide an important check on subjective responses to the *QOL* scales. It is obvious, to the point of evading attention, that the lower needs must be satisfied more frequently than the higher needs. Needs for physiological survival must be satisfied at frequencies of the order of pulse rates (65/min), breathing rates (12/min), eating rates (3-4 times a day), sleeping rates (once a day). Belongingness needs are typically satisfied at lower frequencies, as exemplified by social participation rates for love making (a few times a week), church attendance (a few times a month), and voting behavior (a few times a year). Esteem needs are satisfied even less frequently; the deferred gratification pattern leads to recognition, at the rate of an educational milestone every four years, or of a major contribution to a profession a few times in a lifetime. Lastly, and least frequently, self-actualizing experiences are so rare that they are typically once in a lifetime affairs, with the majority of individuals never having a peak experience.

The hope is that satisfaction frequency data can be used to help quantify a *QOL* score. A minimum frequency at need level i must be attained before the upward transition to the i + 1 level can be made. Perhaps the readiness for an upward shift can be represented by the ratio of satisfaction frequencies, i + 1 to i (the second digit of the three-digit score). Perhaps the frequency of satisfactions at a given level can be used to check the third digit in the *QOL* score.

Certainly an important factor in *QOL* is how one relates to the society of which one is part. If one fails to relate, alienation or anomie is likely to result. If one relates well, the world is likely to seem a warm and happy place. We suggest that this aspect of *QOL* might be gauged through measures of the "porosity" of the interface between the individual and the social system. Operationally one might try to measure such things as an individual's (1) sense of his control over his fate, (2) depth and extent of his trust of others, (3) degree to which elements of the system seem hostile or friendly, (4) nature of perceived blocks to need fulfillment, (5) perceived range and types of societal/individual interactions.

C. "Universal" *QOL* Scales

Once satisfactory *QOL* scales are worked out for the five levels, attention should be paid to devising a single or "master" *QOL* scale that can be administered to anyone (irrespective of his need level) to yield a "universal" *QOL* score.

Several approaches to this problem suggest themselves. In one an attempt would be made to identify sectors of *QOL* concern shared by people at all need levels (such as health or a reasonable standard of living). Questions relating to these areas would seek to place the subject on a 0 - 100 continuum in the fashion suggested in *Toward Master Social Indicators* (40). Figure 1 shows the concept. Overall *QOL* ratings—to state the procedure too simplistically—would

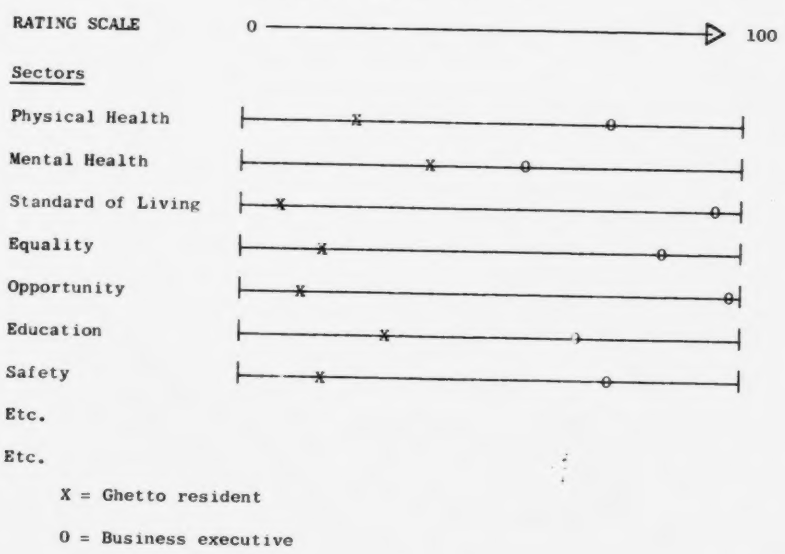

Figure 1 QOL Sector Index

be derived by reflecting the sum of conditions as subjectively perceived. In the illustration, it is evident that the sum of the "X" is much less than the sum of the "0"; this difference is taken as a reflection of the lesser *QOL* of the ghetto resident (represented by the "X") as compared to that of the business executive (represented by the "0").

This approach clearly fails several of the criteria set forth in Section II of this paper. One real difficulty lies in the fact that the *QOL* seems not to move smoothly along any continuum–rather it moves saccadically or in jumps. This is to say that a change in need level seems to involve a step function shift in the internal criteria used to gauge *QOL*. No smooth continuum can directly reflect this kind of phenomenon. Moreover, it is clear that no simple additive procedure is satisfactory. For example, a person might score very high on all sectors other than, say, physical health or mental health. That single low score could negate all the high ratings. Another problem is that the meaning of a score in a sector (e.g., standard of living) depends critically on the NVB mode of the subject. Thus a low standard of living for an esteemer is a far more serious shortcoming than for most self-actualizers. It is possible that some complicated system of weightings might be invented to overcome these problems; even so, the approach seems cumbersome.

A sounder approach would be to seek a total score based on a *QOL* "spectrum". That is, a person's universal or master *QOL* score would consist of the sum of his scores at all levels up to (and possibly even above) his modal pattern. Figure 2 clarifies the notion. Perhaps the most interesting aspect of his approach is that the "degree of coverage" of levels counts toward the total score. This seems a realistic and useful approach that warrants further development after the initial *QOL* scales are worked out.

D. *QOL* Indicators

One might hope eventually to simplify the entire questionnaire approach to measuring *QOL*, whether on a need level or a "universal" basis, by identifying reliable *QOL* indicators. An indicator can be thought of as a pointer to a concept. There can be many different indicators for the same concept, particularly if it is one with a very general definition (i.e., at a high level of abstraction). Terms like *quality of life* are at such high levels of abstraction that the number of possible indicators is very great.

Figure 2 "Spectrum" QOL

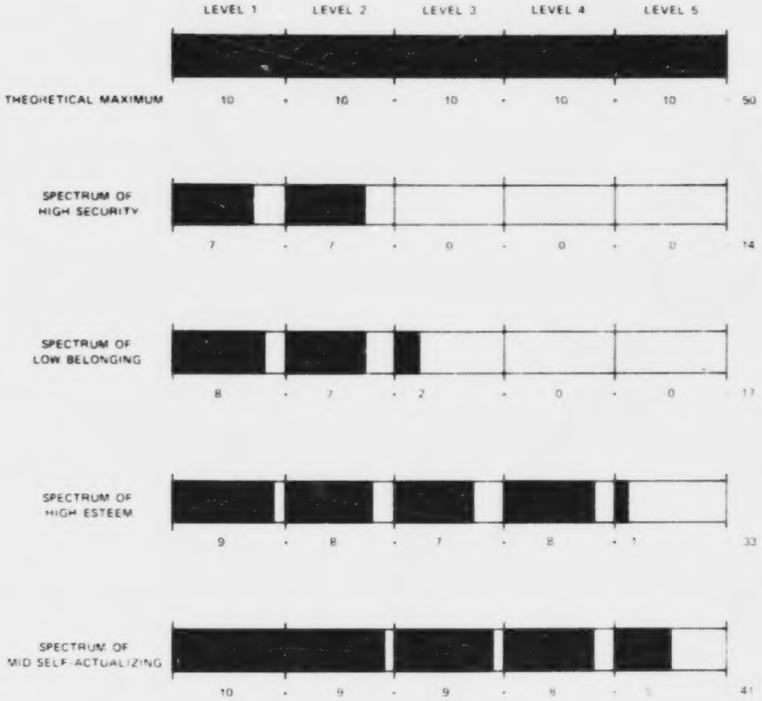

Table 10 helps to illustrate that there are many levels of abstraction from which to choose when selecting indicators for testing hypotheses involving abstract concepts. For example, Table 10 indicates that either assets farm assets, livestock, or cows could be used as an indicator of "wealth". The larger the gap in abstraction levels between nominal and operational definitions (i.e., between general concepts and specific indicators), however, the greater the necessity of using multiple indicators which, together, constitute an instance of the general concept.

Indicators of the same concept, if selected appropriately, will be positively correlated, yet the correlations will not be perfect. A set of N indicators will not only encompass a common core of conceptualized reality, but also may capture N or more other aspects of the conditions being measured. The researcher who selects and evaluates indicators that are capable of tying concepts to the real world has both an empirical and theoretical task. It is his responsibility to determine if the positive but imperfect empirical correlations between indicators of the same concept represent random, idiosyncratic differences, or whether they are due to systematic errors in his theoretical propositions and assumptions.

Table 10

HAYAKAWA'S LADDER OF ABSTRACTION[1]

(Bessie the cow as an instance of several abstract concepts)

Level of Abstraction	Characteristics Included at this Level
1. (Lowest): The process cow	The cow known to science: Ultimately consisting of atoms, electrons, etc., according to present day scientific inference. Characteristics are infinite at this level and ever-changing.
2. The perceived cow	The cow we perceive: Not the word, but the object of experience; that which our nervous system abstracts (selects) from the totality that constitutes the process-cow. Many of the characteristics of the process-cow are left out.
3. "Bessie"	The word "Bessie: (cow 1): This is the name we give to the object of perception of level 2. The name is not the object; it merely stands for the object and omits reference to many characteristics of the object.
4. "Cow"	The word "cow": Stands for the characteristics we have abstracted as common to cow 1, cow 2, cow 3, ...cow n. Characteristics peculiar to specific cows are left out.
5. "Livestock"	When Bessie is referred to as "livestock" only those characteristics she has in common with pigs, chickens, goats, etc., are referred to.
6. "Farm assets"	When Bessie is included among "farm assets," reference is made only to what she has in common with all other salable items on the farm.
7. "Asset"	When Bessie is referred to an an "asset," still more of her characteristics are left out.
8. (Highest): "Wealth"	The word "wealth" is at an extremely high level of abstraction, omitting almost all reference to the characteristics of Bessie.

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[1] From S. I. Hayakawa, Language in Thought and Action, 1949, p. 169.

Before a reliable set of indicators can be selected to help measure *QOL*, it is necessary to have a field-tested theory and an interrelated set of proved-out propositions from which new propositions can be logically derived. Reliability refers to the stability of data collected under a fixed set of conditions, regardless of who collects them or when they are collected. The present document implies much of the theory required to select *QOL* indicators but before such work is justified, field substantiation of the theory is called for.

It seems clear that research on *QOL* and NVBs would ultimately have a variety of end uses if efforts meet with any success. Some of these uses are briefly discussed in Appendix C.

Appendix A

DEFINITIONS OF CONCEPTS

There are a number of reasons to define concepts in developing any conceptual framework. Researchers can think more clearly about *QOL* (*quality of life*) after defining the concepts that are used when *quality of life* is being discussed. A concept is an abstraction from shared experience, an agreement to let a term stand for a meaning. The responsibility of the definer is to identify the range of meanings included, and excluded, when a term is used. He must neither be too ambiguous, nor too precise. If he is too ambiguous (as is always the case when terms are not defined), communication is hampered by the introduction of surplus meaning or by a lack of shared meaning. If he is too precise (as is often the case in operational definitions, where a unique set of measurement operations defines a unique term), the concept will not be applicable in a wide-enough scope of situations and contexts.

The following definitions of concepts include many of the terms that frequently occur in the context of *quality-of-life* discussions at SRI. These are working definitions and may be changed in follow-on work in *QOL* measurement as the need arises. They may shift either toward greater precision, as measurement methods are refined, or toward greater generality, or toward a new terminology that dovetails more easily with an existing conceptual framework. For the time being, however, these are the concepts used in the assumptions and approaches to *QOL* measurement discussed in the main text of this report.

Belief–A statement or sense, declared or implied, intellectually and/or emotionally accepted by a person as being true. Beliefs on the cognitive level relate to what exists (rather than what is preferred) and on the affective level to what is real. Belief-type values are those enduring and deeply held convictions that guide the core behavior of a person or a group.

Belongingness needs–those needs in Maslow's hierarchy of needs generating feelings of companionship, togetherness, love, and kinship with other human beings. Belongingness needs may emerge initially from a view of the group as an extra support for security.

Cultural universal–denotes aspects of culture believed to exist in all societies and attributed in most cases to the necessity of meeting needs common to all men.

Culture–consists of patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiments in objects; the essential core of culture consists of traditional (i.e., historically derived and selected) ideas and especially their attached values.

Drive–denotes the energy, particular to a class of purposive behavior, that moves the individual or members of a group to satisfy a need.

Esteem needs–those needs in Maslow's hierarchy of needs manifested by desires for attention, appreciation, recognition, status, prestige, good reputation, and dominance. When satisfied by the acceptance of others, the individual derives a higher degree of self-acceptance and self-respect. Esteem needs also include a striving for personal adequacy, competence, achievement, excellence, confidence in the face of his expanding world, independence, and freedom to be himself.

Goal–a situation or condition which a person or a group intends to bring about through his or its action to maximize or at least enhance his or its members' state of satisfaction.

Level of aspiration–denotes the goals or standards that an individual sets himself.

Level of living–the actual consumption performance of a group of persons, expressed in terms of the average quantities and qualities of goods and services consumed per unit of time (e.g., a year) and per typical unit of the group (e.g., a family).

Life style–the dominant flair of a person's living pattern. Life style reflects largely how a life is lived, not what is accomplished. Key elements in life style are needs, values, and beliefs.

Maslow's hierarchy of needs–the set of needs that may develop in the life of an individual according to the following sequence: (1) physiological or survival needs, (2) safety or security needs, (3) belongingness needs, (4) recognition or esteem needs, (5) self-actualization or growth needs. True gratification of a need tends to foster the development of the individual and releases his energies for the emergence of the next higher need.

Need–(1) whatever is required for physical well-being, or what if lacking, will lead to internal disturbance that sets off a drive; (2) a requirement of which the person becomes aware when he acquires values that demand he should strive for a certain goal or comport himself in a given fashion in a given situation.

Personality development–the growth of all the many aspects of a person, including the physical, mental, emotional and social, and their organization into tendencies to act during the course of his social life.

Policy—value-based plans or strategies aimed at achieving normative goals.

Priority—the ranking or order of preference in which persons or interests stand in relation to one another.

Program—a proposed set of specific actions intended to implement a policy, together with the specification of objectives to be attained and of measures of the degree of their attainment (i.e., in terms of social indicators).

Quality of life (QOL)—an individual's perceived or felt overall satisfaction of his needs over a period of time.

Safety or security needs—those needs in Maslow's hierarchy of needs (emerging when the survival needs have received at least a minimum level of satisfaction) for protection from harm and for a life that is safe and secure. In general, safety needs are disturbed by anything or any one that is unexpected or unfamiliar.

Satisfaction—the quenching of the desires, wants and needs of the individual, groups, or other constituent parts of a given society.

Security—the condition of being safe; absence of, or protection from, physical danger; the safety and protection of the individual and/or the state; freedom from want, freedom from fears; the absence of specific anxieties, a generalized sense of well-being; material or economic welfare; protection against social hazards or contingencies, freedom from anxiety concerning such hazards, or the steps taken to insure a population against such hazards.

Self-actualization or growth needs—the highest needs in Maslow's hierarchy of needs, which emerge only after the stronger, lower level needs have been satisfied. The satisfaction of these needs correspond roughly to what some personality theorists call the "fully mature" person, adding to the notions of emotional balance and of self-acceptance a notion of drive, of open-ended achievement in unfamiliar and challenging situations.

Social class—all those individuals (or families) who possess within the framework of some society or community relatively the same amounts of power, income, wealth, or prestige or some loosely formulated combination of these elements, who tend to share the same needs, values, and aspirations, and whose interactions with those in other strata are constrained by status differences (i.e., inferiority or superiority).

Social indicator—a quantity of such a kind that, all else being equal, a change in its numerical value is expected to reflect a change in some component of the *quality of life*.

Social problem—a situation affecting a significant number of people that is believed by them and/or by a significant number of others in the society to be a source of difficulty or unhappiness, and one that is capable of amelioration. Thus, a social problem consists of both an objective situation and a subjective social interpretation.

Society—(1) the totality of social relationships among men; (2) a society: each aggregate of human beings of both sexes and all ages bound together in a self-perpetuating group and possessing its own more or less distinctive institutions and culture; (3) the institutions and culture of an inclusive and more or less distinctive and self-perpetuating group of both sexes and all ages (assumes the behavior of people is substantially affected by shared norms and values).

Survival needs—the lowest needs in Maslow's hierarchy of needs derived from the body's automatic effort to maintain the life of the individual (and through him of the species as a whole) by providing an optimum chemical balance, body temperature, rest, sleep, and reproduction. These needs are very strong and, if they are not satisfied, their felt urgency dominates the individual's behavior.

Value—a shared cultural standard that guides and controls day-to-day attitudes and behavior by helping the individual to select goals satisfying his needs or to act in accordance with the expectations of others (who share the standard). A set of these standards may be employed either in "valuing" an action or object (i.e., relating it to needs or desires) or in "evaluating" an action or object (i.e., comparing its relevance to needs with that of alternative actions or objects).

Appendix C

SOME USES OF *QOL* AND NVB STUDIES

A. *QOL* and Studies of the Future

QOL work seems singularly fitted to describing cultures and their positive and negative aspects as viewed by different NVB types. A nation could certainly be aptly described in terms of its NVB profile, and hence alternative futures could presumably be discussed in terms of different profiles, as, indeed, was done in an early EPRC study (29). It seems entirely possible to use NVBs as an entry point for identifying the probable directions of "willed change" in a given society and the probable range of counter-reactions. This, too, was done schematically in one EPRC report (4).

It is suggested that these approaches could be carried much further. Starting from the *QOL* base, a nation's main and sub-NVB patterns could be ascertained in field studies. Directions of NVB change probably could be gauged from content analyses of polls, newspaper stories, etc., as well as by direct surveys of NVB groups. Of especial interest would be identification of the changing manner in which satisfaction of the various core needs is sought. Thus the way in which the esteem drive, for example, is fulfilled is as much a part of a culture as the number of individuals motivated mainly by esteem concerns.

For the purposes of forecasting it would be helpful to know the demographic, economic, and sociological attributes associated with each important NVB pattern and sub-pattern. The change characteristics of these attributes are much better quantified than the shifts among and within NVB types. Thus, at the present state of the art at least, sensible forecasts of some types of NVB change would probably have to be based in large part on shifts in characteristics highly correlated with NVBs.

Analysis of NVB types, distributions, and change patterns could contribute significant inputs to almost any study of future societies and could form the basis of a powerful methodology. Such studies would be equally applicable to tracing the evolution of nations, institutions, and groups. Implications of such NVB shifts extend to consumer markets, demands for governmental services, managerial style, city design, aesthetics, and so on and on.

B. Understanding Societal Change

A useful way of looking at the mystifying business of societal change (this being much more basic than mere social change) is to view it as the result of

NVB shifts. Thus a very important question involves the mechanism(s) of how people or groups move from one need level to another.

Undoubtedly many factors contribute, including the economic, the environmental, and the psychological. In NVB terms there appear to be at least three major modes through which a society changes. First, there are group movements, such as the labor movement or women suffrage earlier in this century or Black Power today. In this kind of shift a group, or class, bands together to impose its NVBs upon society as a whole. Second, there is a generational shift, which is basically a replacement phenomenon. The young grow up holding values different from those of their parents and thus introduce societal changes. Third, there is the mechanism of individual growth. Group movements are confined largely to a single horizontal stratum of society. Generational shift cuts across all strata. Individual growth can occur anywhere and at any age.

It seems clear, as Graves (10) has suggested, that the NVB change of an individual requires three main elements: (1) dissatisfaction with life as it is, (2) sufficient energy to attempt to change life patterns, and (3) the insight to know where and how to induce change in oneself.

We suggest that changes in all three components are essential to effect a deep personality restructuring–an NVB change. Such a person is a grower–in some sense a successful rebel. If dissatisfaction and energy are present, but little insight, the result is a flailer–an ineffective rebel–someone who runs off in all directions at once. If dissatisfaction is combined with insight without the requisite energy, you get a groaner, a complainer, someone who says he has all the answers but does nothing. Finally, if a person has energy and insight but is not unduly dissatisfied with the way things are, you have a leader–a person full of zest and intelligence, willing to work within the existing framework.

Using this approach it would be interesting and useful to study "bridge conditions" between the various need levels. It might well be that the energy requirements, for example, are greater for the transition into security or belonging than for the other interfaces because social roadblocks tend to be severe. Insight requirements may be at their zenith for the step from level 4 to level 5. Similarly, one would like to know what aspect of perceived *QOL* is required at each level to free the individual for upward aspiration.

It is suggested that *QOL* analysis may aid studies of societal change in a fundamental way because people's sense of the quality of their lives has much to do with pressures and directions of social change. The forces of change so basic to societal and personal growth may be the result of interaction among the three components of *QOL* listed in Table 2. For example, goals (column 3) too discrepant from what one has (column 1) would engender dissatisfaction. Insight

Table 2 Three Types of Components In QOL

1	2	3
Physiological	Psychological	Motion/Development
Substantative	Process	Normative
Observed	Felt	Intended
Objective	Subjective	Directional
Position	Action	Guidance
Environmental	Personal	Symbol/Image
Cognitive	Affective	Conative
Things	Relations	Goals
External	Internal	Growth
Physical	Emotional	Vision

to resolve the discrepancy would result from recognition of the nature of the mismatch; energy would come from involvement in the problem on a subjective, felt level (column 2). Thus, it is tentatively proposed, an understanding of the effects of synchronization and of imbalances among *QOL* factors could provide clues to the group(s) within a society that is nearing a change threshold. Understanding of the NVB pattern of the group could provide insight into the nature of the emerging demands and, possibly, the strategies it is likely to employ in pursuing demands for change.

Such questions are obviously of significance for any attempts at social engineering. For example, some societal NVB profiles are probably inherently stable; traditional societies marked by a preponderance of the population at level 3 may be an example. Conversely, preliminary insights drawn from this area may also suggest reasons for the societal turbulence so characteristic of recent U.S. history. For example, one of the authors has expounded a "flare theory" of personality change (30). The unpublished internal memorandum is quoted below in part:

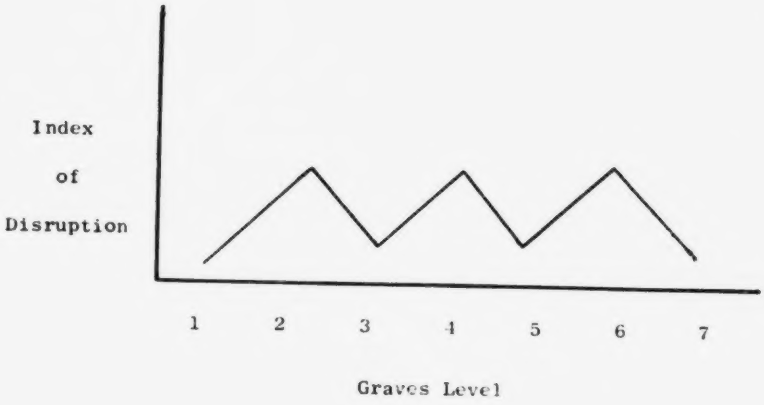
> ...One can put this another way: A person learns to live satisfactorily at a given level. This very fact can produce a boredom type of dissatisfaction. The dissatisfaction builds up in some form of internal energy until it is released, like a solar flare, in a moment or period of insight. A conversion to a higher level has taken place.
>
> This process suggests several things of interest...

First, periods of transition are the wild ones. Most of us are familiar with this on an individual level. More importantly, the phenomenon of mass transition introduces noise into the prevailing social system. We see this today most spectacularly on campus and among minorities. Transition and numbers combine to make the phenomenon of social significance. I believe we can and should systematically ask ourselves where future sources of mass transition are likely to be found. In effect, we should search out groups whose set is on the point of a phase change.

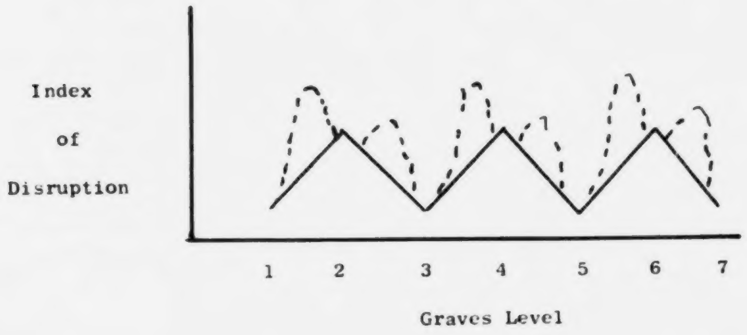
Second, the phenomenon is, by definition, transitory. It will lead to a period of relative stability. Therefore, from society's point of view the problem is to steer and speed the transition in its flare stage, not to fight it.

Third, the phenomenon presumably represents human progress, although it is not likely to be seen as such by all. There is also the implication that transitions cannot be achieved without some sort of disruption. Expectations should be adjusted accordingly.

Fourth, the phenomenon suggests that a changing society has a complex pulsing characteristic. Graves points out that his even-numbered levels are trying to adjust. One might diagram his concept as follows:



I am suggesting that the flare accompanying transition from one level to another introduces a second set of pulses shown by the dotted line



The main message of this roller-coaster profile is that there is not much peace in a changing society–that, in fact, there are three pinnacles of disruption for every trough of relative stability.

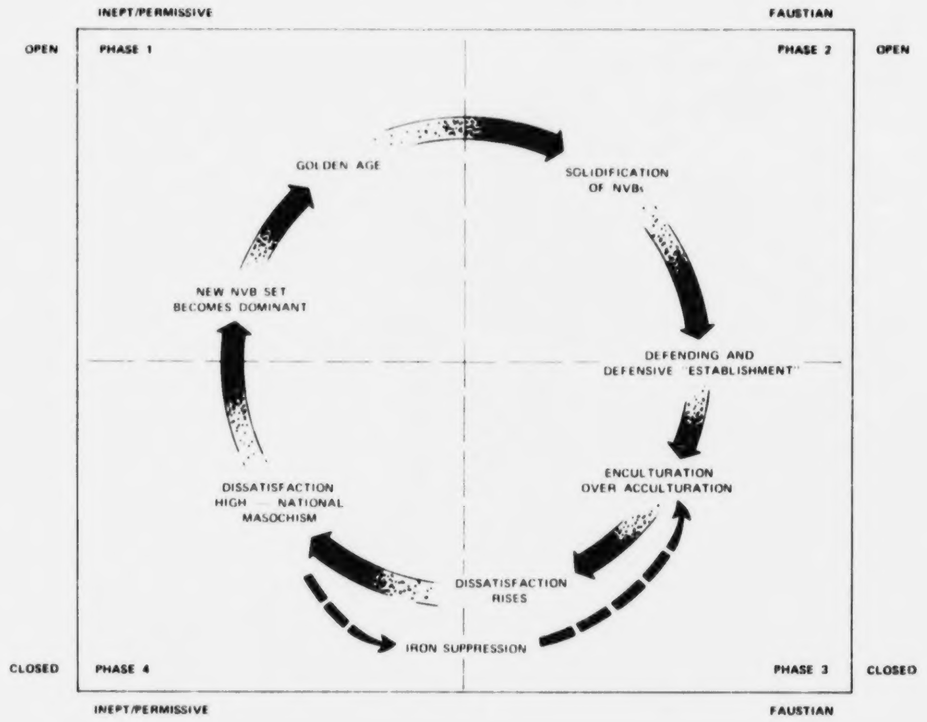
I have made the transition humps leading to "adjusting" levels smaller than those on the upside because adjusters presumably are less messianic than changers.

This sort of thinking can also be applied to aspects of the alternative futures worked out by the EPRC. These futures have been plotted in terms of open/closed and Faustian/inept (or permissive) as shown in Figure 3. If the foregoing model of NVB change is correct, one can hypothesize that a group holding a given NVB set will undergo a series of transmutations as it moves through one NVB set to another. This rhythm characterizes the nation as a whole when the societal leaders are undergoing the NVB change.

Referring to Figure 3: Phase 4 is the dying gasp of an NVB set. Large portions of the group are deeply and vocally and perhaps violently dissatisfied with the society. The group berates the nation and possibly itself. This generates more dissatisfaction, which primes the energy pumps–and so on until something gives.

The giving can take the form of iron suppression of the NVB group by a more powerful faction (reversion to Phase 3 in the diagram) or it can take the form of a new paradigm–a fresh insight into what is of prime importance. In this case Phase 1 is introduced. The vast stores of energy piled up in Phase 4 flow into new NVB channels. Old priorities are abandoned, traditions are set aside as the dissatisfactions of Phase 4 are dissipated via messianic espousal of a new

Figure 3 Life Stages of an NVB Set


INEPT/PERMISSIVE
FAUSTIAN
OPEN
PHASE 1
PHASE 2
OPEN
GOLDEN AGE
SOLIDIFICATION
OF NVBs
NEW NVB SET
BECOMES DOMINANT
DEFENDING AND
DEFENSIVE "ESTABLISHMENT"
ENCULTURATION
OVER ACCULTURATION
DISSATISFACTION
HIGH — NATIONAL
MASOCHISM
DISSATISFACTION
RISES
IRON SUPPRESSION
CLOSED
PHASE 4
PHASE 3
CLOSED
INEPT/PERMISSIVE
FAUSTIAN

NVB. As such, Phase 1 will be transitory, but it may also represent the most exciting, exhilarating, "golden age" period of a nation's cycle of growth. New views are flooding the society, bringing with them a fresh sense of accomplishment, well-being, glory. It can also be a time of high hopes, strong visions, trust in good outcomes, and elation that an answer has at last been found.

Phase 1 starts to merge into Phase 2 as the new NVB set matures. The once-fresh viewpoints settle into the crannies of the society. They become accepted as the "way things are"—thus losing their driving power. The radical fervor abates, changing into an "establishment." As this occurs societal openness wanes and cultural patterns tend to become fixed.

As this process continues, the society passes through a period in which enculturation wholly dominates acculturation. This denotes Phase 3. If the nation is successful, this period may be very prolonged. However, if things go wrong, little dissatisfactions will once again begin to percolate up through the layers of the society wherever people are feeling repressed or otherwise in touch with a view they consider superior to the cultural norm. If the reaction is disregard or suppression, the little fumaroles of dissatisfaction may grow into volcanoes. Thus the swing is away from the Faustian toward the inept pole, even as the "official" society remains closed. In short the society moves toward its dying (Phase 4) period, hopefully once again to be rejuvenated by the clear and lovely emergency of a new NVB song.

C. Strategies for Societal Transitions

QOL and NVB studies appear to have value not only for understanding societal change but for assessing policies and strategies designed to foster or inhibit societal transitions. This field is being vigorously pursued within the EPRC and so need not be discussed extensively here. A few uses of the NVB approach warrant brief mention, however.

It would seem very logical from the NVB standpoint to employ *QOL*-type scales to judge how various segments of the population would respond to plans intended to assist them. *QOL*-oriented evaluations of various welfare, educational, and other "remedial" proposals should help keep legislation in line with the needs and values and beliefs of recipients. The mismatch of NVBs between framers and recipients of social legislation may, in fact, be a chief reason why so many well-intentioned programs fail.

Similarly, interesting results should flow from comparisons of the NVB patterns of society's major institutions (business, church, schools, etc.) with those of their stakeholders. Such match/mismatch analyses help explain why various segments of the population turn against traditional ways of doing things and even attack the basic (often unstated) objectives of institutions.

Clearly, analyses of the NVB patterns of the upper need levels will provide guidance in identifying and selecting long-term national goals. Particular attention should be paid to the kind of social trajectory (third column of Table 2) of foremost appeal to self-actualizing people, since this facet seems to represent the leading edge of the most advanced NVB group.

Policy makers in both the public and the private sectors would do well to consider implications of policies from the NVB standpoint. Table C-1 shows a variety of political attributes that appear to vary with need level. Advance familiarity with such opinions should yield forewarnings of potential opposition.

D. *QOL* and Social Data Systems

One final use of *QOL* and NVB studies is worth brief mention. These kinds of data appear essential for any future social data system designed for social reporting, trend analysis, or predictive accounting. Indeed the availability of such data might spur the development of a nationwide system, possibly along the lines suggested in an EPRC report (40). At a minimum, systematic work in this field should uncover sufficient advantages that the various federal and state agencies concerned with compiling statistics will begin to incorporate *QOL* and NVB concepts into their work.

Table C-1 Political Opinion and Need Level[1]

I. Opinions that scale directly with need level

A. The higher the level from 1 through 4, the more likely the opinion that:

- the level of taxation should be greatly reduced to encourage the development of private venture capital.
- the institution of private property is a sound basis on which to build a society that fulfills needs.
- competition is an effective way of promoting social progress.
- eligibility to vote, marry, or incur contractual obligations should be on the basis of educational level, not age.

B. The higher the level from 1 through 4, the less likely the opinion that:

- there should be a maximum after-tax income that an individual can get each year.
- an increasing portion of industrial profits should go to workers through profit sharing.
- social security should be increased to 50% of one's average wage during the five high-earning years.
- the government should guarantee a job at minimum wage to anyone who wants one.
- health care cost should be reduced significantly even at the expense of doctor's salaries.
- workers should have a greater voice in the policies of companies they work for.
- the government should subsidize recreation facilities for the poor comparable to those for the rich.
- everyone should be guaranteed free health care.
- the nation should establish a guaranteed annual income for all citizens.

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[1] This compilation is based on the data of Tables B-6 through B-9 in Appendix B.

Table C-1 (continued)

II. Opinions that typify need level

A. The following opinions are typical of need level 1 and/or 2:

- there should be a maximum after-taxes income that an individual can receive each year.
- unions should think of the interests of their members rather than the national effect of their actions.

B. The following opinions are typical of need level 3:

- rather than working on his own, an individual should cooperate and work for the common good.
- an individual's primary concern should be for others [Note: self-actualizers may also agree.]
- the good of community or society as a whole should have priority over the good of the individual.
- society, not the individual, is the ultimate source of law.

C. The following opinions are typical of need level 4:

- the U.N. should not have the strongest military force in the world.
- workers should not receive an increasing portion of industrial profits through profit sharing.
- the level of taxation should be greatly reduced to encourage development of private venture capital.
- that government is best which governs least.

D. The following opinions are typical of need level 5:

- educational institutions should not indoctrinate in the American way, but instead should present alternative value systems.
- it is not important to develop new improved techniques for controlling individuals and groups.

Table C-1 (continued)

- the U.S. should not commit more money toward protection against the Red China threat.
- education should train individuals to attain a broad understanding of arts, letters, and sciences rather than to deal with specific, practical problems.
- obedience and authority are not the most important virtues for a child to learn.
- the U.S. should give up sovereignty to a supranational world institution [if the time is right].
- public policy should not be based on the assumption that most people cannot be trusted very far.
- radical change may be necessary even in a nation as successful as the U.S.

REFERENCES

1. Bales, Robert F. and Arthur S. Couch, "The Value Profile: A Factor Analytic Study of Value Statements," *Sociological Inquiry*, Winter 1968.

2. Bauer, Raymond A., ed., *Social Indicators*, The M.I.T. Press, 1966.

3. Bradburn, Norman and David Capolvitz, *Reports on Happiness: A Pilot Study of Behavior Related to Mental Health*, Aldine, 1965.

4. Brandes, Ely M., "Normative, NVB-Based Futures," unpublished memorandum, Educational Policy Research Center, December 1969.

5. Bugental, J. F. T., "Notes on Graves's Levels of Existence Conception," Educational Policy Research Center internal memorandum, August 20, 1969.

6. Cantril, Hadley, *The Pattern of Human Concern*, Rutger's University Press, 1966.

6a. Dalkey, Norman C., Ralph Lewis, and David Snyder, "Measurement and Analysis of the *Quality of Life*," prepared for U.S. Department of Transportation, Rand, August 1970.

7. Drewnowski, Jan, and Wolf Scott, "The Level of Living Index," Report No. 4, United Nations Research Institute for Social Development, Geneva, September 1966.

8. Forrester, Jay W., *World Dynamics*, Wright-Allen Press, 1971.

9. *Goals for Americans*, President's Commission on National Goals, Spectrum Books, 1962.

10. Graves, Clare W., "On the Theory of Value," mimeographed paper, March 1967.

11. Graves, Clare W., W. I. Huntley, and Douglas W. LaBier, "Personality Structure and Perceptual Readiness: An Investigation of their Relationship to Hypothesized Levels of Human Existence," mimeographed paper, May 1965.

12. Gross, Bertram M., "The City of Man: A Social Systems Accounting," in *Environment for Man*, William R. Ewald, Jr., ed., Indiana University Press, 1967.

13. Gross, Bertram M., "The New Systems Budgeting," *Public Administration Review*, March-April 1969.

14. Gross, Bertram M., ed., "Social Goals and Indicators for American Society," *The Annals*, American Academy of Political and Social Science, volumes 371 and 372, May and September 1967.

15. Gross, Bertram M., *The State of the Nation: Social Systems Accounting*, Tavistock Publications, London, 1966.

16. Hammond, Richard J. and Ernest C. Harvey, "Some Tentative Observations on Social Indicators," SRI IR&D Report, June 1970.

17. Harman, Willis W., "Belief Systems, Scientific Findings and Educational Policy," Educational Policy Research Center Research Note 6747-4, November 1967.

18. Harvey, O. J., David E. Hunt, and Harold M. Schroder, *Conceptual Systems and Personality Organization*, John Wiley and Sons, 1961.

19. Inglehart, Ronald, "The Silent Revolution in Europe: Intergenerational Change in Post-Industrial Societies," to appear in the fall, 1971 issue of *The American Political Science Review*.

20. James, Dorothy Buckton, "Poverty, American Values and Change," delivered at Annual Meeting of the American Political Science Association, Los Angeles, September 1970.

21. Kantor, Robert E., "Psychological Theories and Social Groupings," Educational Policy Research Center Research Memorandum 6747-5, SRI, November 1969.

22. Kluckhohn, Florence R. and F. L. Strodtbeck, *Variations in Value Orientations*, Row, Peterson, 1961.

23. Kohlberg, Lawrence, *Stages in the Development of Moral Thought and Action*, Holt, Rinehart, & Winston 1970.

24. Krieger, Martin H., "Social Indicators for the Quality of Individual Life," Center for Planning and Development Research, University of California, Berkeley, Working Paper 104, October 1969.

25. Logothetti, Thomas J., "Social Measurements Handbook," compiled for SRI, 1970.

26. Maslow, A. H., *Motivation and Personality*, Harper, 1954.

27. Maslow, A. H., *Religions, Values, and Peak-Experiences*, Ohio State University Press, 1964.

28. Maslow, A. H., *Toward a Psychology of Being*, 2nd ed., Van Nostrand, 1968.

29. Mitchell, Arnold, "Alternative Futures: An Exploration of a Humanistic Approach to Social Forecasting," Educational Policy Research Center Research Note 6747-2, SRI, November 1967.

30. Mitchell, Arnold, "Note on Personality Change," internal memorandum, Educational Policy Research Center, September 1969.

31. Mitchell, Arnold and Mary K. Baird, "American Values," Long Range Planning Service report No. 378, SRI, June 1969.

31a. Peterson, Richard, *On a Typology of College Students*, 1965.

32. Roberts, Thomas B., "Toward a Humanistic Social Science: A Consciousness Theory Outlined and Applied," *Journal of Human Relations*, Fourth Quarter 1970.

33. Rokeach, Milton, "The Role of Values in Public Opinion Research," *Public Opinion Quarterly*, Winter 1968-1969.

34. Sheldon, Bernert Eleanor and Howard E. Freeman, "Notes on Social Indicators: Promises and Potential," *Policy Sciences* 1, 1970.

35. Sheldon, Bernert Eleanor and Wilbert E. Moore, eds. *Indicators of Social Change: Concepts and Measurements*, Russell Sage Foundation, New York 1968.

36. "Social Reporting in Michigan: Problems and Issues," Center for Urban Studies, Wayne State University, Technical Report A-37, January 1970.

37. Springer, Michael, "Social Indicators, Social Reports, and Social Accounts," Operation PEP, San Mateo County Board of Education, March 1970.

38. *Toward a Social Report*, U.S. Department of Health, Education, and Welfare, GPO, 1969. This is the so-called "Olson report" because it was prepared under the direction of Mancur Olson.

39. *Toward Balanced Growth: Quantity with Quality*, National Goals Staff, Washington, D.C., July 1970.

40. "Toward Master Social Indicators," Educational Policy Research Center Research Memorandum 6747-2, SRI, February 1969.

41. Trow, Martin, "Student Cultures and Administrative Action," 1962.

42. Trow, Martin and Burton Clark, "The Organizational Context," 1966.

43. Vestermark, S. D., Jr., ed., "Indicators of Social Vulnerability," Human Sciences Research, Inc., McLean, Virginia, August 1968.

44. Wilson, John O., "Regional Differences in Social Welfare," draft, Midwest Research Institute, Kansas City, August 1967.

HOPES AND FEARS OF THE AMERICAN PEOPLE

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Albert H. Cantril and Charles W. Roll, Jr., *Hopes and Fears of the American People*, A Potomac Associates Book, New York: Universe Books, 1971, pp. 1-15.

HOPES AND FEARS OF THE AMERICAN PEOPLE

Albert H. Cantril and Charles W. Roll, Jr.

Analysts of contemporary America make many and varied assessments of what they see as the unhealthy state of the nation. The characterizations of the situation differ: a national crisis of identity, a failure on the part of our major institutions, the alienation and isolation of the individual. Central to the concern, no matter how it is expressed, is the call for a reformation of old assumptions about how men relate to each other and to their institutions.

Such a revolution in values ultimately means the abandonment of old assumptions on a scale so broad that new views will take hold among the public at large. But this is a painful process, for assumptions will be abandoned only insofar as frustration with them is truly widespread. The process at best is uneven, and the resistance is great.

To find out how responsive or resistant Americans are to such change is what we set out to do. Admittedly, it was an ambitious undertaking. It involved nothing less than an attempt to define the basic hopes and fears of the American people.

To get at this level of opinion, we used a technique that has become known as the "self-anchoring striving scale." The technique was developed by the late Hadley Cantril and his colleague, Lloyd A. Free, in connection with a series of studies conducted in eighteen different countries between 1958 and 1964 by the Institute of International Social Research. Their interest was to determine patterns of human aspiration among people living under varying kinds of political systems and at various stages of national social and economic development.*

In the striving scale technique, the respondent is first asked to describe what life would be like if he were to imagine his future in the "best possible light." This question is open-ended and the respondent's comments are recorded verbatim by the interviewer. The respondent is then asked the opposite: what his future would be like in the "worst possible light." Again, his comments are recorded verbatim. The actual wording of the questions follows:

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* Among countries included in the Institute's studies were the United States, West Germany, Great Britain, France, Japan, Yugoslavia, Poland, Israel, India, the Philippines, Nigeria, Cuba, and the Dominican Republic. The results of the studies appear in: Hadley Cantril, *The Pattern of Human Concerns* (New Brunswick: Rutgers University Press, 1965); Lloyd A. Free and Hadley Cantril, *The Political Beliefs of Americans* (New Brunswick: Rutgers University Press, 1967); and F. P. Kilpatrick and Hadley Cantril, "Self-Anchoring Scaling: A Measure of Individuals' Unique Reality Worlds," *Journal of Individual Psychology*, XVI (November, 1960): 158-73.

> All of us want certain things out of life. When you think about what really matters in your own life, what are your wishes and hopes for the future? In other words, if you imagine your future in the *best* possible light, what would your life look like then, if you are to be happy? Take your time in answering: such things aren't easy to put into words.
>
> Now, taking the order side of the picture, what are your fears and worries about the future? In other words, if you imagine your future in the *worst* possible light, what would your life look like then? Again, take your time in answering.

The substance of the hopes and fears mentioned is subsequently coded by major categories of concern.

The respondent is next shown a picture of a ladder, symbolic of the ladder of life (see figure 1). The top rung of the ladder, he is told, represents the entire complex of hopes he has just described as the ideal state of affairs, and the bottom rung represents the worst state of affairs. He is then asked to indicate where he feels he stands on the ladder at the present time in relation to his aspirations, where he believes he stood five years ago, and where he thinks he will be five years hence.

—— 10 ——
—— 9 ——
—— 8 ——
—— 7 ——
—— 6 ——
—— 5 ——
—— 4 ——
—— 3 ——
—— 2 ——
—— 1 ——
—— 0 ——

Figure 1

The respondent's ladder ratings are self-anchored in that the top and bottom of the ladder are defined in his own terms. Thus a present ladder rating of "6" for an upper-middle-class housewife in the New York suburbs is the psychological equivalent of a "6" rating for a sharecropper in the Southwest, even though the substance of their hopes and fears may differ markedly. Further, the respondent's three ladder ratings can be compared, giving a measure of his personal sense of accomplishment (as indicated by the ladder rating shift from past to present) and personal sense of optimism (as indicated by the shift from present to future).

The same series of interrelated questions is then asked about the United States to determine the respondent's hopes and fears for the nation. The respondent is asked to describe the best and worst possible states of affairs for the United States and to indicate national ladder ratings for past, present, and future.

This striving scale has been employed twice before in the United States, in 1959 and 1964, by the Institute for International Social Research. We were able to cite these earlier results, thereby placing our own findings in perspective. In all three surveys, The Gallup Organization was commissioned to do the polling, so there is comparability between the Institute's results and our own.

HOPES AND FEARS FOR SELF

The American people continue to be preoccupied with two matters–health and their standard of living (see table 1). These two items were cited most frequently as both hopes and fears in 1959, 1964, and 1971, though they were mentioned with considerably less frequency in 1971.

Although the chief hopes and fears expressed by Americans have changed little in the past twelve years, Americans appear to be less preoccupied with what has traditionally comprised the American Dream. This conclusion can be drawn from the decreased frequency with which people mentioned, as either hopes or fears, higher standard of living, fulfillment of aspirations for children, owning a home, availability of leisure time, and assurances of a happy old age.

A change in personal concerns is evident in the topics mentioned more frequently in our January survey than in the earlier studies–drugs, pollution, and crime. These new concerns relate to problems demanding social rather than individual solutions.

One economic matter much on the public's mind is inflation, having bounded into public consciousness over the past few years. In 1959 and 1964, only 1 percent and 3 percent, respectively, spoke of a fear of inflation; in our survey, 11 percent did. Yet concern over unemployment, at a time when the

Table 1 Personal Hopes And Fears in percentages*

	Personal Hopes		
	1959	1964	1971
Good health for self	40	29	29
Better standard of living	38	40	27
Peace in the world	9	17	19
Achievement of aspirations for children	29	35	17
Happy family life	18	18	14
Good health for family	16	25	13
Own house or live in better one	24	12	11
Peace of mind; emotional maturity	5	9	8
Having wealth	2	5	7
Having leisure time	11	5	6
Happy old age	10	8	6
Good job; congenial work	7	9	6
Employment	5	8	6
Freedom from inflation	1	2	6
Other general concerns for family	7	4	5

	Personal Fears		
	1959	1964	1971
Ill health for self	40	25	28
Lower standard of living	23	19	18
War	21	29	17
Ill health for family	25	27	16
Unemployment	10	14	13
Inflation	1	3	11
Unhappy children	12	10	8
Drug problem in family	--	--	7
Pollution	--	--	7
Political instability	1	2	5
No fears at all	12	10	5
Crime	--	--	5

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*A shift of 4 percentage points among the three studies (1959, 1964, 1971) is considered statistically significant.

number of people out of work remains high, is not much changed from that of the 1959 and 1964 surveys.

Personal anxiety over international tensions seems to have leveled off. Since 1964, war as a fear has declined, and the slight increase with which peace was mentioned as a personal hope is statistically insignificant. The jump in personal concern over international tensions occurred between 1959 and 1964–years when the cold war was marked by such events as the Cuban missile crisis, the Vienna Summit, and the downing of a U-2 reconnaissance plane over the Soviet Union.

One of the most important variations in the patterning of concerns is found between the young (those twenty-one to twenty-nine years of age) and their elders. The young people appear to be burgeoning with aspirations. In our January survey, they displayed a greater degree of concern about a broader range of issues than older people did. The young mentioned more frequently concern about a higher standard of living, good family life, a better home, personal wealth a good job, and solutions to the pollution and crime problems. In only one area were they less concerned than their elders–health. With high hopes, youth has much to be frustrated about and is likely to be impatient.

Table 2 compares the 1959, 1964, and 1971 ladder ratings people gave themselves with respect to their own personal lives. On the whole, these ratings reflect a considerable sense of personal accomplishment: the rating for the present is eight-tenths (+0.8) of a step higher than that for the past–almost a full step on a ten-step ladder. The public is also optimistic about the future: the ladder rating for the future is nine-tenths (+0.9) of a step higher than that for the present. As might be expected, too, young people exhibit the greatest hopefulness in their ladder ratings (see table 3).

Despite the relative satisfaction of Americans at the personal level, significant pockets of frustration and hopelessness do exist. Those with only a grade school education gave themselves a personal ladder rating for the present that is exactly the same as their rating for the past. Their ladder rating for the future was just two-tenths (+0.2) of a step higher than that for the present.

A similar picture emerges among lower income groups: their ladder rating shows no real movement from past to present (-0.1 of a step) and no significant increase from present to future (+0.4 of a step). The relatively static rating for lower income groups may be attributable in part to the inclusion of a large proportion of retired persons whose incomes place them within the lowest quarter of the economic scale. On the whole, older people generally displayed only slight shifts in their personal ladder ratings.

Table 2 Personal Ladder Ratings

	1959	1964	1971
Rating			
Past	5.9	6.0	5.8
Present	6.6	6.9	6.6
Future	7.8	7.9	7.5
Shift[a]			
Pass to present	+0.7	+0.9	+0.8
Present to future	+1.2	+1.0	+0.9

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[a] A shift of 0.6 in a rating is considered statistically significant.

Table 3 Personal Ladder Rating Shifts By Population Groups

	past to present	present to future
	1971	1971
NATIONAL	+0.8	+0.9
Age		
21-29	+1.6	+1.8
30-49	+1.1	+1.2
50 & over	+0.2	+0.1
Education		
College	+1.3	+1.1
High school	+0.9	+1.1
Grade school	0.0	+0.2
Income		
Upper	+1.6	+1.0
Upper middle	+1.1	+1.0
Lower middle	+0.5	+0.8
Lower	-0.1	+0.4
Race		
White	+0.8	+0.9
Nonwhite	+0.4	+1.0

Significantly, these pockets of despair are not concentrated in the nonwhite community. Table 3 shows that there are no truly meaningful differences in ladder-rating shifts between races. Although nonwhites gave themselves lower ladder ratings than whites, on the key point of movement from past to present to future the races differed little in their perceptions.

Although Americans show some apprehension over a range of emergent social concerns, they appear on the whole to be personally rather satisfied with their lot.

HOPES AND FEARS FOR THE UNITED STATES

When it comes to hopes and fears for the United States, however, the picture is one of considerably less assurance. Table 4 makes clear that issues of war and peace have consistently dominated the aspirations and fears Americans have for their nation. In 1971, though, the percentage mentioning war as a fear dropped to 30, from 64 percent in 1959 and 50 percent in 1964. The percentage citing fear of communism has dropped since 1964, too–from 29 percent to only 12 percent. Further, those mentioning reduction of international tensions as a hope declined from 17 percent in 1959 to 7 percent in 1971. These changes probably indicate that the public is moving away from its earlier perception of a bipolar world preoccupied with the threat of nuclear holocaust. In fact, of the 30 percent mentioning fear of war in our study, only 11 percent referred to nuclear war. Another 7 percent spoke of the Vietnam War, and the remaining 12 percent referred to war in general.

As a national issue, the state of the economy is clearly bothering the American people. Concern over inflation has escalated as both a hope and a fear. Hope for economic stability jumped from 5 percent in 1964 to 18 percent in 1971 at the same time that its converse, fear of economic instability, moved from 13 percent to 17 percent. But, just as we saw with respect to personal hopes and fears, unemployment has not evoked increased national concern–regardless of the continued urgency of the problem.

Drug use and pollution emerged distinctly as new national concerns in our study. One respondent in ten listed solving pollution problems as a hope for the nation; 6 percent cited solution of the drug problem. On the other side of the scale, drugs and pollution were newly cited fears, just as at the personal level. There was virtually no mention of either in 1959 or 1964.

Our most startling finding, however, was a new and urgent concern over national unity, political stability, and law and order. As a hope for the nation, national unity jumped from 1 percent in 1959 to 15 percent in 1971. In other words, one out of every seven Americans in our study cited national unity as an aspiration. Increased mention of hope for law and order was nearly as

Table 4 National Hopes And Fears

	national hopes		
	1959	1964	1971
Peace	48	51	51
Economic stability; no inflation	12	5	18
Employment	13	15	16
National unity	1	9	15
Law and order	3	4	11
Better standard of living	20	28	11
Solution of pollution problems	--	--	10
Settlement of racial problems	14	15	10
Improved public morality	7	10	8
International cooperation; reduced tensions	17	6	7
Solution of drug problem	--	--	6

	national fears		
	1959	1964	1971
War (esp. nuclear war)	64	50	30
National disunity; political instability	3	8	26
Economic instability; inflation	18	13	17
Communism	12	29	12
Lack of law and order	3	5	11
Pollution	--	--	9
Drugs	--	--	7
Racial tensions	--	9	7
Unemployment	7	6	7
Lack of public morality	4	5	6
Loss of personal freedom	4	5	5

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*A shift of 4 percentage points among the three studies (1959, 1964, 1971) is considered statistically significant.

pronounced. And, most striking of all, one American in four (26 percent) listed national disunity or political instability as a fear for the nation—a more than threefold increase over 1964.

The depth of the concern is apparent in the comments of respondents. A forty-nine-year-old accountant in Vermont told the interviewer, "I fear more riots or even revolution if we don't solve some of our present problems." A twenty-two-year-old mother in Nebraska said, "If people do not learn to live together with what they have, they will be fighting and trying to get more and more while people lose their freedom." A forty-seven-year-old mechanic in Texas commented, "We would be tearing and burning everything up. There would be no regard for the other man. If you wanted something, you'd just take it."

As table 5 shows, fear of national disunity and political instability was expressed by all segments of the population: young and old, well and poorly educated, rich and poor, nonwhites and whites, Democrats and Republicans.

Table 5 Mention Of National Disunity And Political Instability As A National Fear By Population Groups in percentages*

NATIONAL AVERAGE	26
Age	
21-29	29
30-49	24
50 & over	24
Education	
College	26
High school	23
Grade school	24
Income	
Upper	29
Upper middle	28
Lower middle	25
Lower	20
Political affiliation	
Democrat	27
Republican	24
Independent	25
Race	
White	25
Nonwhite	26

This public anxiety about the state of the nation was dramatically revealed by the ladder ratings citizens gave their country (see table 6). Looking at the United States in January, 1971, Americans gave a rating (on a ten-rung ladder) of 6.2 for five years past, 5.4 for the present, and 6.2 for five years in the future.

In other words, Americans sense that their country has lost rather than gained ground over the past five years–as evidenced by the drop from past to present in the national ladder rating of nearly a full step.

Looking ahead, people expect the United States in 1976–our bicentennial year–to be merely where it was a full decade earlier, having barely recovered the reverses of the last half decade.

Table 6 National Ladder Ratings

	1959	1964	1971
Rating			
Past	6.5	6.1	6.2
Present	6.7	6.5	5.4
Future	7.4	7.7	6.2
Shift*			
Past to present	+0.2	+0.4	-0.8
Present to future	+0.7	+1.2	+0.8

*A shift of 0.6 in a rating is considered statistically significant.

The importance of the drop in the ladder rating from past to present can scarcely be overstated. In the many studies in which the Institute for International Social Research used the striving scale technique, only once did a present national ladder rating fall below that for the past. This occurred in the Philippines in 1959, at a time when the country appeared to lack strong, dynamic leadership and seemed to many of its people to be standing still.

Historically, shifts in ladder ratings have proven very sensitive indicators of national mood. In Cuba, for example, the Institute conducted a study in mid-1960, after Castro's ascent to power. The national ladder ratings showed that the Cuban public was very excited and optimistic about the revolution. There was a jump from past to present of nearly five steps on the ladder and from present to future of just under two. Clearly, with this amount of internal enthusiasm, there was little reason to believe the Cuban population would join an uprising to oust Castro. This fact was given implicit recognition after the abortive Bay of Pigs invasion by Arthur Schlesinger, Jr., then serving as a special assistant to President John F. Kennedy. In a note of acknowledgement to the Institute, Mr. Schlesinger wrote: "I read with interest your Cuban report–and only wish that a copy had come to my attention earlier."

Another case was that of the Dominican Republic. National ladder ratings derived from a 1962 survey showed an intense sense of frustration. Almost half of the population gave the country a zero ladder rating for the past, yielding an average past rating of only 1.7. The present rating was just one step higher. The future rating, however, was over four steps above that of the present. These results prompted Lloyd Free to point to a revolutionary situation in the Dominican Republic almost three years before the 1965 crisis actually occurred. These cases, and others, are described in *The Human Dimension: Experiences in Policy Research*, by Hadley Cantril (Rutgers University Press, New Brunswick, New Jersey, 1967).

This sense of national regression is evident among most population groups (see table 7). In particular, the disparities between population groups at varying education and income levels with respect to personal ladder ratings do not appear in the national ratings. Similarly, there is little difference between age groups.

Table 7 National Ladder Rating Shifts By Population Groups

	past to present	present to future
	1971	1971
NATIONAL	-0.8	+0.8
Age		
21-29	-0.6	+1.0
30-49	-0.8	+0.9
50 & over	-1.0	+0.7
Education		
College	-0.6	+0.9
High school	-0.9	+0.8
Grade school	-0.8	+0.7
Income		
Upper	-0.8	+1.0
Upper middle	-0.9	+0.8
Lower middle	-0.7	+0.9
Lower	-0.8	+0.7
Race		
White	-0.9	+0.8
Nonwhite	+0.6	+0.7

Where differing assessments do appear is between races. The national ladder rating given by whites declined nearly a full step (-0.9) from past to present. In contrast, the rating given by nonwhites rose by more than half a step (+0.6), indicating that nonwhites sense measurable accomplishment. This shift is in sharp contrast to the situation in 1959, when exactly the opposite pattern obtained (see table 8). While the progress of recent years has quite obviously not resolved the racial crisis, our findings nevertheless indicate that nonwhites believe gains have been made at the national level.

The national ladder ratings also reveal that people of all political persuasions believe the nation has slipped (see table 9). Although Democrats and those disapproving of President Nixon's handling of his job naturally sense the greatest decline, they are not alone. Our findings assume greater significance

Table 8 National Ladder Rating Shifts By Race

	past to present 1959	past to present 1971
White	+0.3	-0.9
Nonwhite	-0.3	+0.6

Table 9 National Ladder Rating Shifts By Political Persuasion

	past to present 1971	present to future 1971
Political affiliation		
Democrat	-1.0	+0.8
Republican	-0.6	+1.0
Independent	-0.8	+0.7
Nixon job rating		
Approve	-0.6	+0.8
Disapprove	-1.2	+0.9

when they are set against those of the highly partisan year of 1964 (see table 10). Then, the sense of accomplishment over the preceding five years was great among the Democratic "ins," but the feeling was not shared by the Republican "outs." Now, however, even among Republicans, the sense of decline is pronounced.

Table 10 Shifts In National Ladder Ratings In 1964 And 1971 By Political Affiliation

	past to present 1964	past to present 1971
Democrats	+1.1	-1.0
Republicans	-0.8	-0.6
Independents	0.0	-0.8

We found no single predominant cause behind the drop in the national ladder rating. The sense that the country has moved backward over the past five years is shared by all those who mentioned the principal national fears of war, national disunity, inflation, lack of law and order, communism, and pollution (see table 11).

Table 11 National Ladder Rating Shifts By Major National Fears

	past to present 1971
NATIONAL AVERAGE	-0.8
Those mentioning:	
Communism	-1.3
Lack of law and order	-1.1
National disunity and political instability	-0.9
Economic instability and inflation	-0.9
War	-0.7
Pollution	-0.6

The hopes and fears expressed by the American people are thus full of paradox.

On the personal level, Americans express less concern than they did five or ten years ago with the material elements that have traditionally comprised the American Dream. Their concerns, too, have broadened to include problems that cannot be solved by the individual alone -drugs, inflation, pollution, and crime. In their personal ladder ratings, they display a considerable sense of achievement and optimism.

On the national level, however, the picture differs. Most striking is the degree, in all segments of the population, to which fear of national disunity is expressed. The mood of the people is vividly shown in the ladder ratings they gave their country--a present rating almost one step below that for the past, and a future rating that merely compensates for the ground lost in the last five years. The American people clearly feel their nation is in trouble.

THE *QUALITY OF LIFE*
A TRY AT A EUROPEAN COMPARISON

by

DR. LORE SCHEER

THE QUALITY OF LIFE

A try at a European comparison

In the peaceful competition between nations, there are different possibilities of determining who is first, who is ahead. We may go by the number of ski champions or Nobel prize winners, by the strength of the military forces or by the gross national product (GNP) per head of the population. This last yardstick will make the most sense to the economist, who will go on to explain that the level achieved in an international comparison is useful in forecasting, in checking on the rightness of past economic policy or in deciding on the further course a nation should pursue in order to strengthen its international standing.

The GNP per head does not, however, say enough about that which we call *quality of life*. One lives worse–according to western standards even with a higher income, in an out-of-the-way smoky industrial town or in the vast woodlands of Australia, than one does in Austria. For estimating that which we call "level of living" (Lebensniveau) we need therefore to consider many other criteria, yet if such are included, the final picture may be radically changed.

How to measure the level of living

Even though in scientific studies we need not necessarily ask of what usefulness such studies are, the value of studies dealing with the level of living is clear. Just as a government should be able to account for the relative level and the development of the GNP, it should also know what determines the level of living and how this is developing in its own and in other countries. In Austria, where there is a shortage of labor in certain sectors–as in the building industry, but also in hotels, restaurants and hospitals–government should know how attractive living conditions in Austria seem to workers from abroad, whether conditions appear good enough for them to want to work here; or for example why in the western provinces of Austria people prefer to work across the border in Germany or in Switzerland rather than at home.

But how can we measure the "how well we live"? And if we can measure it, how can we find one definition for the "how well" to suit all Austrians–those from Burgenland in the east of the country as well as those in the province of Vorarlberg in the west or in the capital city of Vienna–employees as well as employers and those living on pensions–blue collar workers as well as white collar workers and farmers–a definition which the majority of these very different groups could accept. **If we succeed in agreeing on such a definition for the welfare of the people, then we can apply it–in a limited way–and for a limited span of time–to countries which lie in roughly the same geographical region and have reached a similar stage of development.**

The Ministry of Economy of the Federal Republic of Germany recently submitted a forecast of the probable growth of the economy up to the year 1985, according to which the "personal standard of living" and the gross social product will nearly double during these 15 years. We could infer from this, that if something is doubled, it must be quantified.

Economists and statisticians have not yet found an acceptable method for measuring the *quality of life.* But it's only a little more than one generation since the member countries of the Economic and Social Council of the United Nations agreed to accept international norms and methods for measuring the gross national product. So we can say that, as regards the measuring of the *quality of life.*, we are, scientifically speaking at approximately the same point where we were with regard to the GNP before agreement was reached.

In a study on measuring minimum standards of living, N.N. Franklin of the International Labour Office reached the conclusion that we can define neither poverty nor a minimum standard of living, nor a condition in which minimum needs are satisfied in a way that is "right or wrong". All we need is a definition that is **"useful"**.[1] If we defined poverty differently, more or fewer families would be said to be in poverty, but we could still carry out the operations of diagnosis, target-setting, selection of policy instruments and review of progress towards objectives.

We don't doubt that measuring the level of living or the welfare which has been achieved is a difficult task. There will be disagreements and differences of opinion as to which indicators to include and how these should be weighted. Replacing a more or less reasonable indicator by another perhaps better indicator may improve the comparison, but surely the effect will be similar to that experienced by improvements in price indicators. More exact measurements and better assigned weights -the value of which we don't want to question-result in having an index series which to the surprise of some differ often only by fractions of a percent from the old "bad" index.

The term "level of living"

As already mentioned, there exists no one definition of standard of living as there is none of poverty or welfare. International organizations have been working for years towards agreeing on one single comprehensive measure.

The term "standard of living" is used by us today to cover three different concepts which were distinguished by a committee of experts of the United Nations in 1954 as follows:

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[1] International Labour Review, April 1967, pp. 271-198.

- the **level** of living–refers to the actual living conditions of a people,
- the **standard** of living–refers to the aspirations or hopes of a people, namely the living conditions which it aspires to or considers as adequate and right, and
- living **norms**–refer to the desired living conditions which are defined for particular aims, as for example the establishing of minimum wage and working norms.

On the basis of joint consultations by representatives of the United Nations and its organizations, a study was published in 1961 on the international definition and measurement of levels of living in which we read that "the most satisfactory approach to the international measurement of levels of living was through the measurement of clearly delimited aspects or parts of the total life situation that were amenable to quantification and that reflected generally accepted aims of social and economic policy at the international level".[2]

It is clear why no single comprehensive measure of levels of living was found which would be acceptable to all countries of the world–to the U.S.A. as well as to India, to Albania as well as to Sweden. The discussion had been based on a system of "components" (for example health) and specific statistical measures or "indicators" (for example infant mortality rate) which had been suggested for measuring the components, account being taken of the availability and international comparability of data.

These components are.[3]

1 health
2 food consumption and nutrition
3 education
4 conditions of work
5 employment situation
6 aggregate consumption and savings
7 transportation
8 housing including household facilities
9 clothing

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[2] "International defintion and measurement of levels of living", United Nations, New York 1961. E/CN 3/270/Rev. 1.

[3] Some of these (aggregate consumption, savings and transportation) were later not considered as "components" of the level of living, but together with population, labor force, income and expenditures and communication added as a category of "basic information". Nevertheless all headings were kept in one form or another.

10 recreation and entertainment
11 social security
12 human freedoms

As far as quantification goes, the reader will find that these components or sectors with the exception of the last pose difficult but statistically not insoluble problems. But how can we quantify human freedoms? Yet isn't human freedom one of the most important components of the level of living? Who of us would want to live in a country which abounds in milk and honey, but in which the people are not free?

Choice of indicators

The present study is a first attempt, based on foreign studies, to determine how the development of the *quality of life* in Austria compares with that of other countries. The best foreign study on which to base these considerations in Austria seemed to me to be the SWIGES study of the West Berlin Center for research into the future.[4]

This SWIGES-Report describes a method for comparing conditions in different countries over a span of time with respect to chosen characteristics. To test the method the Berlin research center had taken the six countries of the European Economic Community and compared their development trends in the sphere of "living standards" for the years from 1957 to 1976.

Using these data for the Common Market countries, I worked out comparable time series for Austria and fed these to the computer in Berlin.[5]

How can such a comparison be actually carried through? The SWIGES-model is based on 53 indicators. **This choice of indicators can be accepted till the mid-seventies.** For comparisons extending over a longer period other or possibly additional indicators which will then presumably be of more importance in determining the *quality of life* and which possibly can then be quantified, should be included.

Here follows the list of the 53 SWIGES-indicators:

1 GNP per head of the population (in DM) (purchasing power parity)
2 Share of the gross investment in the GNP (in %)

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[4] "Strukturentwicklung der Wirtschaft und Gesellschaft von Einzelstaaten und Staatengruppen am Beispiel des Lebensstandards in den EWG-Landern" (abbreviated SWIGES) by the "Zentrum Berlin fur Zukunftsforschung" in West Berlin.

[5] The author is deeply indebted to the Zentrum Berlin fur Zukunftsforschung for its generous cooperation.

3 Average gross hourly wage of a worker in industry (in DM)
4 Share of wages and salaries in national income (in %)
5 Unemployment: those seeking work/total labor force
6 Jobs available/labor force (in %)
7 Share of the labor force in total population (in %)
8 Weekly hours worked by workers in industry
9 Strikes: participating workers/workers in industry (in %)
10 Average number of workdays lost through accidents at work in the iron and steel industry
11 Savings: share of savings in the national income
12 Savings deposits per inhabitant (in DM)

Expenditure in percent of personal consumption for:

13 Recreation and entertainment
14 Transportation and communication
15 Personal care and health
16 Household operation
17 Household goods
18 Heating and lighting
19 Housing
20 Clothing
21 Tobacco
22 Beverages (alcoholic and non-alcoholic)
23 Food (excluding beverages)
24 Expenditure for personal consumption per inhabitant (in DM)
25 Number of telephones per 1000 inhabitants (registered phones)
26 Number of television sets per 1000 inhabitants (registered sets)
27 Number of radios per 1000 inhabitants (registered sets)
28 Consumption of fuels (coal and coal equivalent of other fuels–in kilograms)
29 Number of physicians per 100,000 ihabitants
30 Number of hospital beds per 10,000 inhabitants
31 Infant mortality=deaths under one year of age per 1000 live births
32 Public expenditure for social security in % of GNP
33 Share of dwelling units with running water in the total number of dwellings (in %)
34 Share of dwelling units with bath in the total number of dwellings (in %)
35 Public expenditure for education in percent of national income
36 Number of university students per 1000 inhabitants (total enrollment)
37 Number of 14-year-old pupils in percent of all 14-year-olds
38 Number of 16-year-old pupils in percent of all 16-year-olds
39 Number of 18-year-old pupils in percent of all 18-year-olds

40 Total circulation of daily newspapers per inhabitant
41 Number of newspapers per inhabitant
42 Number of books published per inhabitant (including 2nd editions)
43 Number of books translated per inhabitant
44 Consumption of printing and writing paper (except newsprint) per inhabitant
45 Number of admissions to motion picture theaters per year, per inhabitant
46 Number of museums per inhabitant
47 Number of libraries per inhabitant
48 Pieces of regular mail handled per inhabitant (domestic mail)
49 Number of passenger cars per 1000 inhabitants
50 Fatal traffic accidents in percent of population
51 Defense expenditure in percent of GNP
52 Emigrants in percent of population (citizens, long-term)
53 Immigrants in percent of population (long-term).

Basically it could be questioned, if data, based on different definitions in the various countries, collected by different methods and sorted and compiled in different statistical ways, can be compared. And even if the data were collected in any one way, there would still be different valuations, as basic difinitions differ often. The SWIGES-report says, since the data pertain to average values and since it cannot be checked whether the international compatiblity of the indicator-evaluation is wholly assured, the data can at best be regarded as **"characteristic"**. We repeat characteristic and not necessarily wholly exact.

An objection which is often made with regard to international comparisons pertains to the incomparability due to the different purchasing power of the currencies. Different purchasing power parities as for example the official exchange rate and purchasing power comparisons lead to different results. Thus, for the Austrian schilling and the German mark, there is firstly an official exchange rate, secondly an exchange rate based on the purchasing power of the Austrian schilling in Germany, that is for a German shopping basket of goods and thirdly, the rate according to the purchasing power of the German mark in Austria.

In the model used only 4 out of the 53 indicators are expressed in a currency, namely GNP, hourly wages of workers in industry, savings deposits and personal consumption. In one case–namely for the per capita GNP–the purchasing power exchange rate according to the German method of calculation was used, for the rest the official exchange rate.

Generally, only nominal values were used. This means that an inflationary rate enters the monetary figures. And this may show up sharply in the GNP which is given in current prices. In extrapolating beyond the year 1967, price increases are therefore included and the price increases of the year 1967 and the last years prior to 1967 (1967, 1966, 1965) have more weight due to the weighted regression. Using real values would be possible, but would also raise new problems. A basic year would have to be found in which the economy in all six countries of the European Economic Community was operating at relatively the same level—and this did not exist; otherwise different basic years would have to be chosen.

Nearly all indicators are expressed as percentages (for example share of gross investment in GNP) or as a number per head of population (for example fuel consumption).

A further objection relates to the fact that the polling to determine the indicators was carried through in Germany and therefore the German way of life largely determined the choice of indicators.

Naturally the way of life differs in the six countries of the European Economic Community and there are differences between the German and the Austrian way of life. These dissimilarities, however, are not so profound as that the way of life of one of these seven cannot be taken for purposes of comparison.

Due to a particular feature—for example a common language—the importance of an indicator can differ in the different countries. Within the countries of the European Economic Community the number of books published per head of population may be an acceptable indicator; but in Austria where all books of the German-speaking countries (Germany, Switzerland and Austria) are available, this indicator loses in importance.

We repeat we need indicators that are characteristic for Germany as well as for most of these countries. National preferences (wine, beer) as well as different climatic conditions (the need for heating in northern countries, but hardly in southern Italy) are subordinated, since these probably cause fewer divergencies in the calculations than the different definitions and methods of compiling data. (What for example is an institution of higher learning in Germany, what in France? The difference is large. Or when is an emigrant counted as an emigrant? As soon as he leaves the country or years later when it's clear that he won't come back? What is an immigrant who subsequently emigrates? Is he still counted as an immigrant?) Here we see that the wine-beer-question is not a decisive one and also that we in Austria can accept the German norms for a trial study—as a first approximation for Austria.

What is Austria's position?

A final question remains. Can Austria be at all compared with the countries of the European Economic Community or are the differences so great that a comparison is not possible? What does a study of the indicators show?

The values of the indicators during these years under consideration show that **Austria often lies in the middle range**, that is neither near the top nor near the bottom. This is true for example for the share of gross investment in the GNP. This applies also to labor market indicators with Austria having little unemployment and few jobs available.

Austria holds first place as regards the share of public expenditure in the GNP spent on social security.

Austria also holds first place amongst the seven countries as regards the number of physicians in relation to the size of the population. Having relatively more doctors doesn't automatically mean that each larger community has a doctor nor that everyone has the right to consult a doctor when the need arises and to do so under the social security system. Nor do the figures tell anything about the doctor's training or his specialization. The figures simply mean that the chances of getting medical care are larger and that on the average more Austrians can profit from this than can the people in the countries of the European Economic Community.

Austria also holds first place as regards the number of museums and libraries in relation to the size of population. Even though these figures don't tell how many people actually visited the museums or how many books were borrowed in the libraries, these latter figures would again not tell anything about the number of books available in the libraries or about the kind of books offered the public. Nevertheless it may be assumed that a person living in a town or city has, on the average, more and easier access to museums and libraries, if there are more in that town or city.

There are fewer strikes in Austria than in any of the EEC-countries. Counting strikes is a dubious task. How many strikes were called? How long did they last? Did these strikes cause other sectors of the economy to suffer? Were plants closed? Were strikes broken by force? The strike-indicator shows only that there were strikes. Yet the fact that there were strikes may be taken as proof that the workers have the right to strike and that as a last resort they can call a strike in order to call public attention to their problems and force the employers to make concessions. If the strike-indicator is low in Austria–(and it would be low no matter how this indicator would be measured) then this is due to the stand taken by employers and employees. This does not mean, however, that Austrian workers are not aware of their rights or don't have any.

The author would suggest that instead of taking the "strike-indicator" just described, an indicator be taken that would merely assert or deny the existence of the right to strike in a country, without any time series. The same would apply for example to the indicator expressing the right of a country's citizens to emigrate.

In Austria the number of workdays lost in the iron and steel industry due to accidents at work is low. It has been mentioned that public expenditure for social security is very high. Certainly other factors also account for the low accident at work figures, such as the intense campaign against accidents carried on in plants.

The share of military expenditure in the GNP is low, too.

There are also dark spots in the Austrian level of living, according to the indicators used, namely the high number of fatal road accidents and the high consumption of alcoholic drinks.

Subsequently some of the relationships existing between the indicators were examined more closely. Here as in the model generally, the actual values were used for the years from 1957 through 1967 and the values until 1976 were estimated by a weighted regression curve.

A comparison of the **GNP per head** shows that Austria is ahead of Italy, but lagging behind all other EEC-countries (see Appendix, pg. 98).

As regards the share of **gross investments** in the GNP, Austria holds a high position, in fact following right behind Luxemburg and Holland (see Appendix, pg. 99(A).

The share of Austria's **public expenditure for education** in the national income is, according to the figures given, very low. But it should be remembered that no official figures exist for such expenditures. Time series exist only for federal expenditure on education. The values used are those of the UNESCO, but these could easily underestimate the sphere of education don't show up in the officially published statistics (see Appendix pg. 99(B).

The first few of the diagrams that follow show fuel consumption as well as the number of telephones, of cars, radios and television sets in use–each compared with the GNP per head of population. Then follow comparisons of the share of expenditures for food, drink, clothing, rent and recreation in personal consumption–each indicator again compared with the GNP per head of the population. These diagrams show clearly that Austria lies in the middle range of the EEC-countries and that these comparisons with very few exceptions (such as the share of expenditures for beverages and for rent in the personal consumption) shows a rather clear-cut trend (see Appendix pp. 100-105).

The general index of this medium-term model combines the 53 indicators and tries to trace their general trend. This general index, the average or total mark of the level of living shows that Austria lies in the middle range.

Methods of calculation used

(a) The first of three evaluations

Each indicator was given a weight which should show to what extent it can be used to describe, in part, the level of living. It should be emphasized that the **weight** is not supposed to reflect the importance of the particular indicator, but rather **its part in improving the level of living.**

In the SWIGES-study the weights of the 53 indicators used were determined by polls and these were then made to add up to 100.

The indicators used which have the biggest weights are:

– the number of telephones per head of population	2.8%
– the number of physicians per head of population	2.7%
– the share of public expenditure for education in the national income	2.7%

The lowest weights were given to:

– strikes	0.9%
– number of workdays lost in the iron and steed industry due to accidents at work	0.8%
– share of pupils in all youths of the age (for 14,16 and 18-year-olds)	0.8%

(b) Linear model–not applicable

A linear model should be mentioned briefly, even though such a model cannot be applied in measuring the level of living.

One particular year--in our case 1967–was chosen as a base year. In the **linear** model the index of the level of living **was set equal to 100 for each country in the year 1967**.

The calculations were carried through separately for each country. The results, however, can neither be compared nor put in relation to one another, since the conditions in the base year differed widely.

Thus it is clear that too much depends on the base year (that means whether the economic situation was favorable in the particular country in that year or not) and that too much depends on chance.

A look at the following graph shows how the year 1967, which was not at all typical for the strike-indicator in Austria from 1957 to 1967, throws the Austrian index of the level of living out of line. The same thing is true, although less pronounced, for Belgium.

In conclusion: The index derived from a linear model would make sense only if the year chosen as the base year, in our case 1967, would be typical for the time series of all indicators of the countries. Since this can never be, it follows, **that a linear model cannot be used to estimate an index of the level of living.** (See Appendix pg. 106).

(c) 2nd valuation

In addition to the first valuation, the assigning of weights–which was the same for the linear and the non-linear model–in a second valuation **each indicator was assigned one of four functions** to show the value or the contribution of each of these indicators towards the level of living. **Such a valuation was found necessary as the effect on the level of living does not increase to the same extent as the indicator grows or increases.**[6]

Examples may show this more clearly. When one earns little, a rise in income means more than when one earns a lot. Or the total number of people working: When several members of a family have the opportunity to work–and want to work–this raises the family income, raises the level of living. When, however, all people must work–whether they want to or not–be this because of the economic or the political situation in the country–this lowers the level of living. In other words, for a certain time, the value of this indicator rises, exerting a favorable effect on the level of living; then a maximum is reached; thereafter any further rise in the indicator implies a lowering in the level of living.

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[6] **In general, the assumption is true that a rise in an indicator corresponds to a higher value of the indicator. Higher wages earned or more libraries accessibile signify a better level of living. Indicators, for which the opposite is true, however, also called "negative" indicators, where a lower value of the indicator implies a higher level of living–such as for example unemployment, traffic accidents, infant mortality–were counted in such a way that a reduction in the size of the indicator corresponds to a rise in the level of living.**

The four functions used are:

- Function **A**–a straight line. This was used for 5 indicators including
  - infant mortality,
  - number of dwelling units having running water,
  - number of dwelling units having a bathroom.

  (See Appendix pg. 107).

- Function **B**–a continuously rising curve of decreasing growth rate or in other words, rising but levelling off. This was used for 21 indicators including
  - the number of telephones, radio and television sets per inhabitant,
  - fuel consumption per inhabitant,
  - the share of public expenditure for education in national income.

  (See Appendix pg 107).

- Function **C**–a curve reaching a maximum; the decrease is slower than the preceding rise; in other words–a gentle dropping off following the saturation point. This function was used for 16 indicators including
  - the share of gross investment in GNP,
  - The share of wages and salaries in national income,
  - The share of public expenditure for social security in GNP,
  - The number of passenger cars per inhabitant.

  (See Appendix pg. 107).

- Function **D**–also a curve with a maximum, but differing from the last curve in that the drop following the saturation point is a sharp, steep one; this means that beyond the saturation point any rise in the indicator has a very unfavorable effect on the level of living. This function was used for 11 indicators including
  - the share of the labor force in total population,
  - the number of hours worked per week by workers in industry,
  - the share of personal consumption spent on tobacco and on food.

  (See Appendix pg. 107).

(d) 3rd, last valuation

For the non-linear functions, that is for all except the straight line, an additional point must be estimated for each indicator. This valuation corresponds to a **target-setting** which should indicate-as seen today-**what values** these indicators are likely to reach **in Germany by the year 1980, that is what values would be desirable as well as within reach**. It was assumed that the development of these indicators could still be more or less foreseen over the span of ten years.

The second valuation, the choice of the function, is based on the results of polls. On these graphs the horizontal axis gives the values of an indicator; the vertical axis shows the contribution of the particular indicator to the level of living. The valuation equal to "1" is the value of this indicator in Germany in the base year 1967. A further point "a" is the target set for 1980 in functions C and D; that is the valuation = 2 corresponds to the point where "a" cuts the curve. In function B the "a" is calculated from the equation with the previously estimated target for 1980.

Two examples show how the "a" was computed. The first pertains to the **number of passenger cars per 1000 inhabitants**. In 1967 the Germans had 184 cars per 1000 people. In making an estimate for 1980 other factors had to be taken into consideration such as the expansion of the road-network and the quality of other means of transportation (railroads and bus connections). Such factors were called **limiting conditions** of the indicators, since the indicators can exist only in connection with their surroundings. This interrelation with the environment was not dealt with explicitly in the SWIGES-model, but it would be possible to include it.

Also not specially considered, but latently entering into the model are the **interdependencies** of the indicators with one another. Increasing the number of passenger cars per 1000 inhabitants–without changing the limiting conditions, for example without expanding the road network–would affect the indicator "fatal traffic accidents".

The figure which therefore seemed feasible for Germany for the year 1980 was 500 cars per 1000 people. This does not exclude different targets being set for later years, all the more so, since the limiting conditions and the interdepencencies can undergo change and do undergo change. Such changes can be the result of structural changes which take place without part of the social system itself being changed, as for example technological development, or they can be the result of changes in the system itself, as for example less individual traffic. Such changes can largely be foreseen for a span of ten years. Not considered were economic crises or recessions, which could altogether change the development of the indicators and thus render the estimates for the year 1980 out of place.

It remains to be seen whether the effect a particular indicator has on the level of living changes at the same pace near the base year (1967) as near the target year (1980) or quicker or slower. Around the base year the effect in this case is strong (possessing a car today still implies a considerably higher level of living for a person living in Germany); around 1980 a certain saturation is likely to have been reached and a car more or less should not mean as big a change in a person's level of living as today.

Presumably after 1980 more value will be set on a more luxurious equipping of cars. This would call for different primary data, that means not according to the number of passenger cars per 1000 inhabitants. But for the seventies for Western Europe, the indicator "number of passenger cars per inhabitant" suffices.

Example 2: **personal consumption per inhabitant.**

Since the subjective evaluing of the indicator personal consumption largely depends the same time each rise seems very significant, if the achieved level is low, but much less significant if the consumption is already high, the function B was chosen. There is no optimal personal consumption. The value in the year 1967 was 4743 DM that is the personal consumption per German. The target set for 1980 was 10,000 DM. Inserting this value in the equation of function B we obtain an "a" of 3.087.

$$\text{valuation}_{1980} = \text{a. log} \frac{\text{value}_{1980}}{\text{value}_{1967}} + 1$$

$$1 = \text{a. log} \frac{10{,}000}{4{,}743}$$

(e) Non-linear model

The model is a medium-term one. The functions used are non-linear. The targets were set for the year 1980.

The base country was Germany, the base year 1967. This means the valuation–or the contribution to the level of living–of each indicator was set for Germany in the year 1967 equal to "1". In this way the different countries could be compared with one another.

The target value for 1980 (in our case for Germany) was given the value "2". If by 1980 or before 1980 the target should be reached this would not mean, however, that this is the optimal, best or most desirable target in regard to the level of living. Reaching the value 2 also doesn't mean a doubling of the effect a particular indicator has on the level of living.

This non-linear model can–within given limits of time and space–be applied for medium-term forecasting (see Appendix pg. 108).

Conclusions

In the year 1957 Austria's level of living–measured by the German standard–and on the basis of this attempt at applying a model was just barely under that of France. Italy's level was much lower.

1970 Austria had passed France and was just overtaking Belgium. According to this study, this development will continue through 1975 and **Austria's level of living will lie right in the middle range of that of the European Economic Community**, with Germany and Holland at the top and the level in Belgium, France and Italy below that in Austria.

Postscript

Some time has passed since these calculations were made. In the meantime the author attended the 138th meeting of the American Association for the Advancement of Science in Philadelphia. At a symposium there scientists debated the question whether an index measuring *quality of life* can be constructed at all.

The author is convinced that the method explained in this study can be made to work, even though it should preferably first be somewhat refined.

The model can still be improved on. The social indicators, if chosen in Austria, would not necessarily be the same as those chosen by a large European country. Indicators which don't say much or no longer have much meaning should be revised or not included at all. The number of letters mailed within a country for example, hardly means anything in Europe anymore. How many of these letters are really letters, how many are bills, advertisements, answers to contests and the like. More decisive perhaps in determining the level of living than the number of letters mailed or received could be the fact whether mail is still delivered on Saturdays or whether post offices are open Saturdays.

It would be important to try to quantify indicators which pertain to the security and the safety of man and to his environment.

The author is not in principle against using output or result indicators rather than input indicators (for example, asking "How healthy is the population?" instead of asking, "How many doctors and hospital beds are at the disposal of the population, how much money is available for medical care?"). Result indicators should, however, only be used when they clearly express something. The state of health of a population can indirectly be determined amongst other things by the expected length of life, though, in fact, it could only be determined if the people had medical check-ups at regular intervals: in Austria such examinations are still the exception.

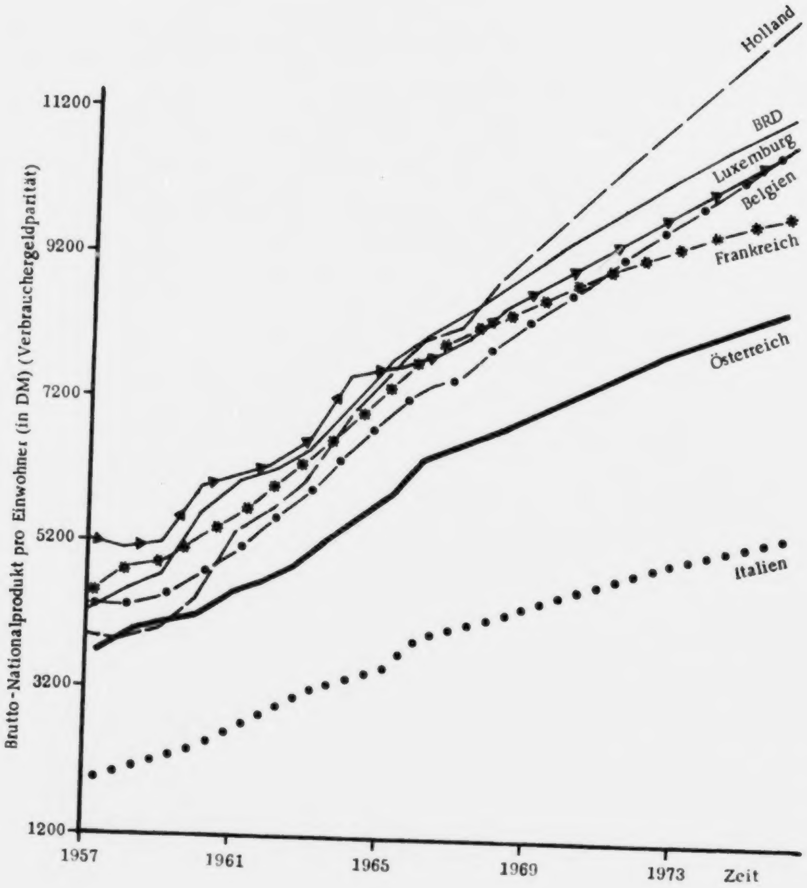
And how can we measure successful schooling? The number of engineers employed doesn't say whether these work in the profession they learned, doesn't say whether they are capable engineers, whether they like their work, whether their schooling and training really brought them "success".

> **What is new in the method used is the three-way evaluation which takes account of the fact that each indicator's contribution in helping to determine the level of living has—in the long run—a turning or saturation point and that once this point is passed—as seen today—what more this indicator contributes is no longer favorable to the individual, in fact, rather than raising his level of living tends to lower it.**

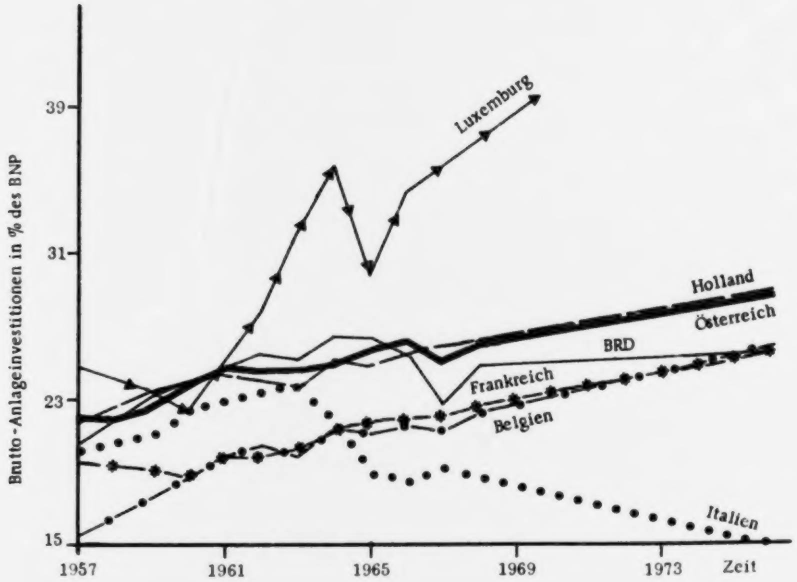
The methods of calculation used may, to some, seem strange, because they are not used to them. We accept that which we're accustomed to. Prof. Margaret Mead expressed it so well in Philadelphia when she said, "We're willing to homogenize wage rates—those of the carpenter and of the nuclear physicist". Wage rates are not questioned today. They're published in international statistics. We don't ask what does such an average mean. We accept such values and use them for purpose of comparison.

An index representing the level of living would be a similar "average". It would not give or indicate any absolute value or level. But it could help to recognize trends and to make comparisons possible.

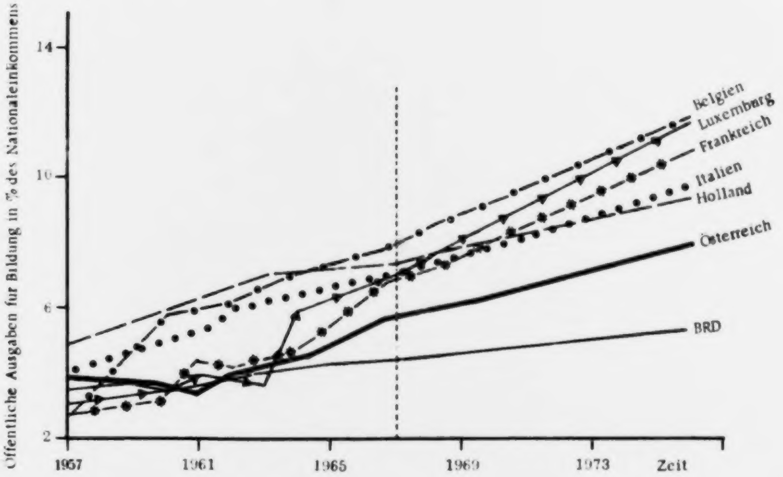
APPENDIX

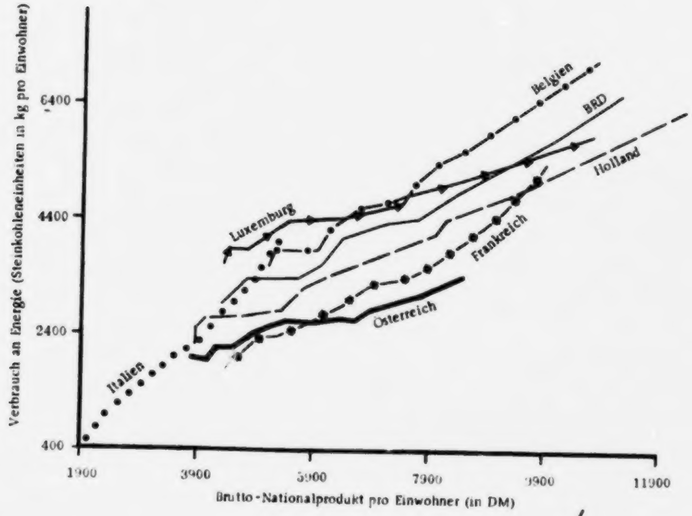

Brutto-Nationalprodukt pro Einwohner (in DM) (Verbrauchergeldparität)
11200
9200
7200
5200
3200
1200
1957
1961
1965
1969
1973
Zeit
Holland
BRD
Luxemburg
Belgien
Frankreich
Österreich
Italien

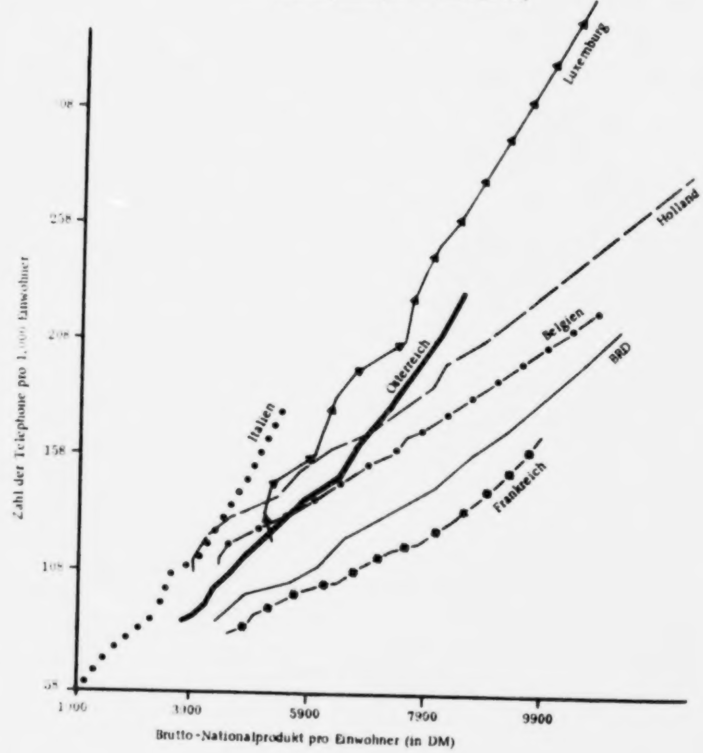
(A)

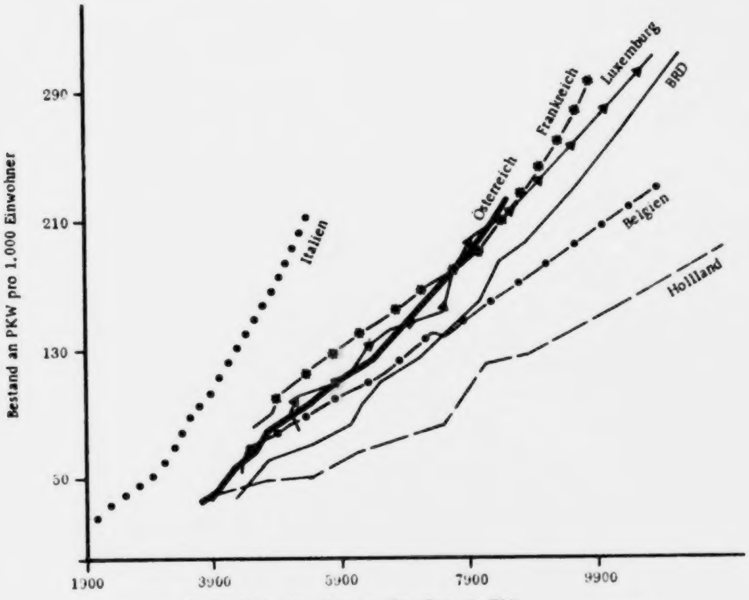

Brutto-Anlageinvestitionen in % des BNP
39
31
23
15
1957
1961
1965
1969
1973
Zeit
Luxemburg
Holland
Österreich
BRD
Frankreich
Belgien
Italien

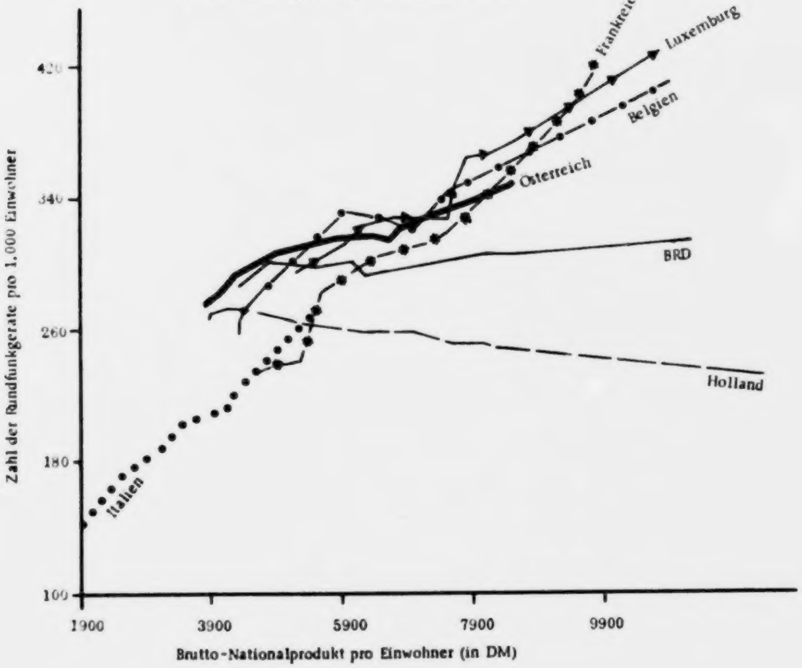
(B)

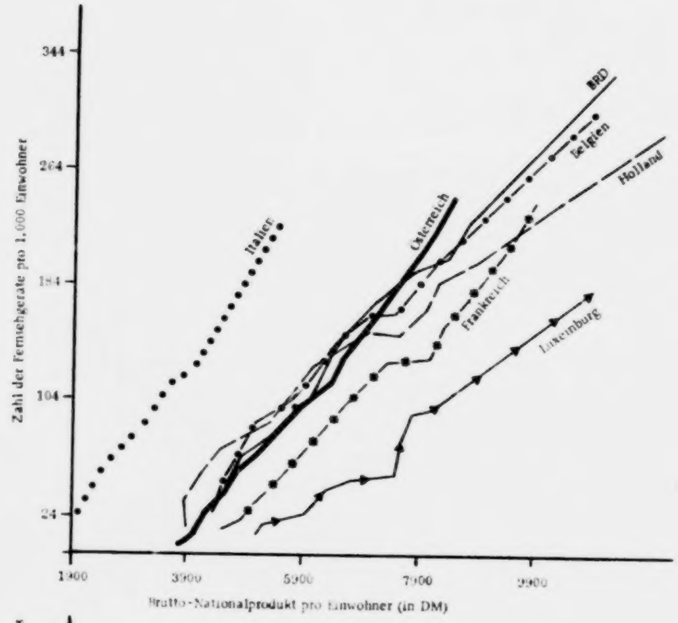

Öffentliche Ausgaben für Bildung in % des Nationaleinkommens
14
10
6
2
1957
1961
1965
1969
1973
Zeit
Belgien
Luxemburg
Frankreich
Italien
Holland
Österreich
BRD

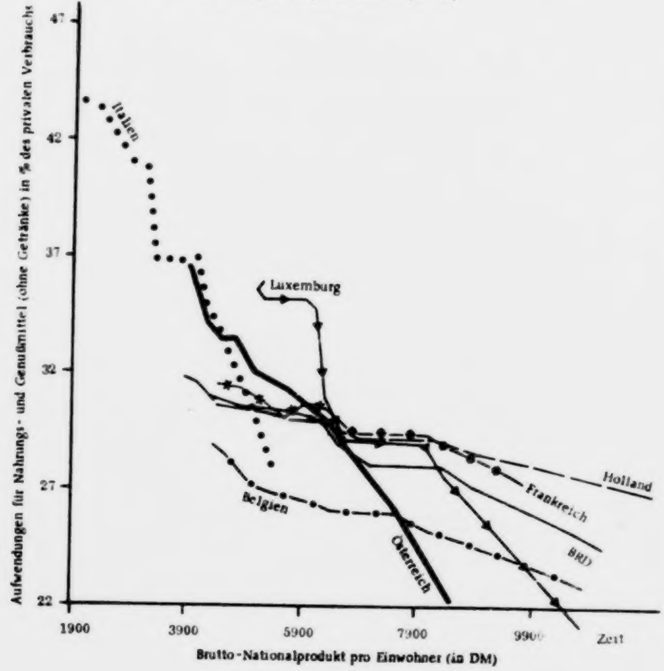

Verbrauch an Energie (Steinkohleneinheiten in kg pro Einwohner)
6400
4400
2400
400
1900
3900
5900
7900
9900
11900
Brutto-Nationalprodukt pro Einwohner (in DM)
Belgien
BRD
Holland
Luxemburg
Frankreich
Österreich
Italien

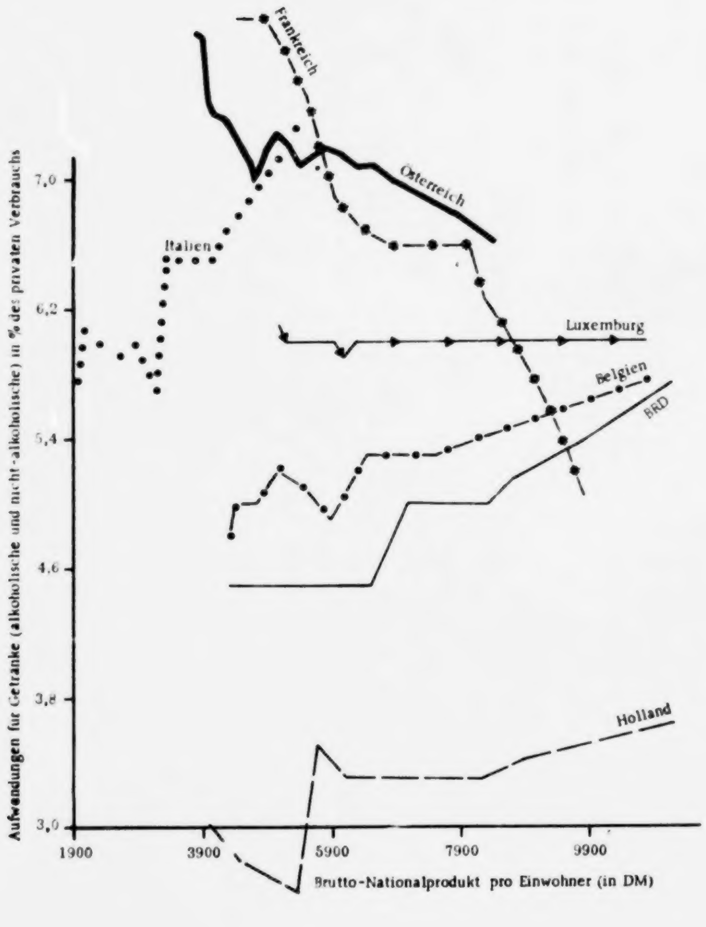

Zahl der Telephone pro 1.000 Einwohner
308
258
208
158
108
58
1900
3900
5900
7900
9900
Brutto-Nationalprodukt pro Einwohner (in DM)
Luxemburg
Holland
Belgien
BRD
Österreich
Italien
Frankreich

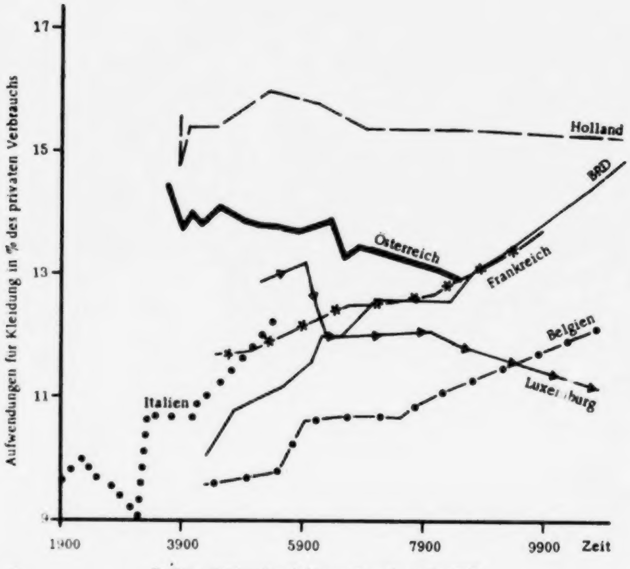

Bestand an PKW pro 1.000 Einwohner
290
210
130
50
1900
3900
5900
7900
9900
Brutto-Nationalprodukt pro Einwohner (in DM)
Italien
Österreich
Frankreich
Luxemburg
BRD
Belgien
Holland

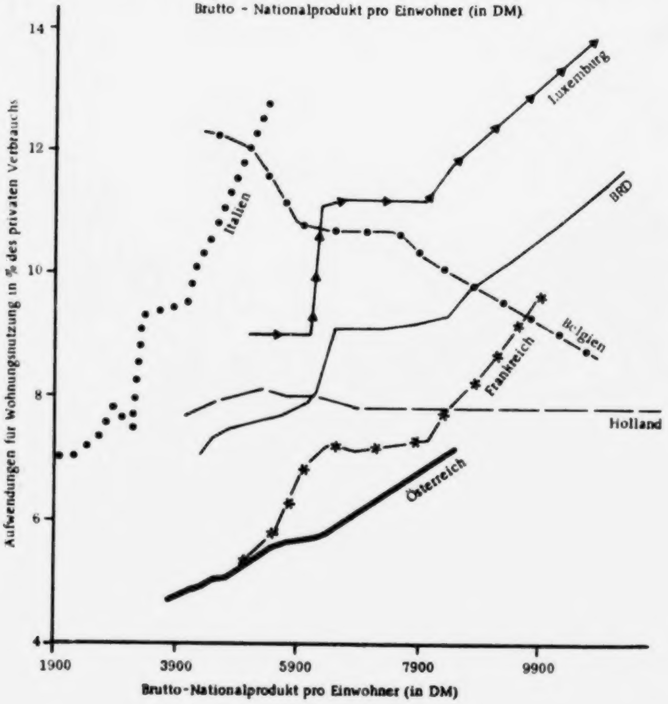

Zahl der Rundfunkgeräte pro 1.000 Einwohner
420
340
260
180
100
1900
3900
5900
7900
9900
Brutto-Nationalprodukt pro Einwohner (in DM)
Frankreich
Luxemburg
Belgien
Österreich
BRD
Holland
Italien

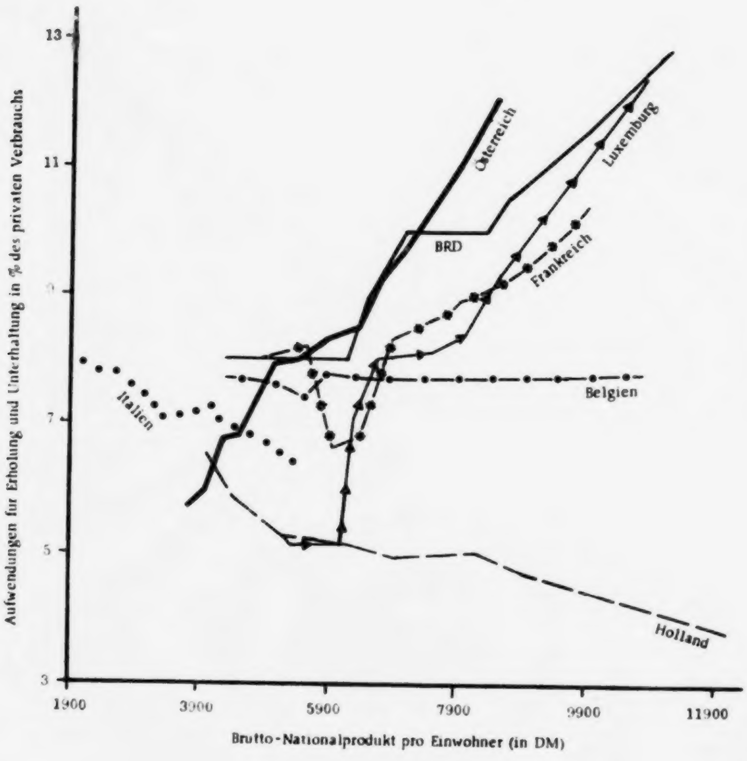

Zahl der Fernsehgeräte pro 1.000 Einwohner
344
264
184
104
24
1900
3900
5900
7900
9900
Brutto-Nationalprodukt pro Einwohner (in DM)
Italien
Österreich
BRD
Belgien
Holland
Frankreich
Luxemburg

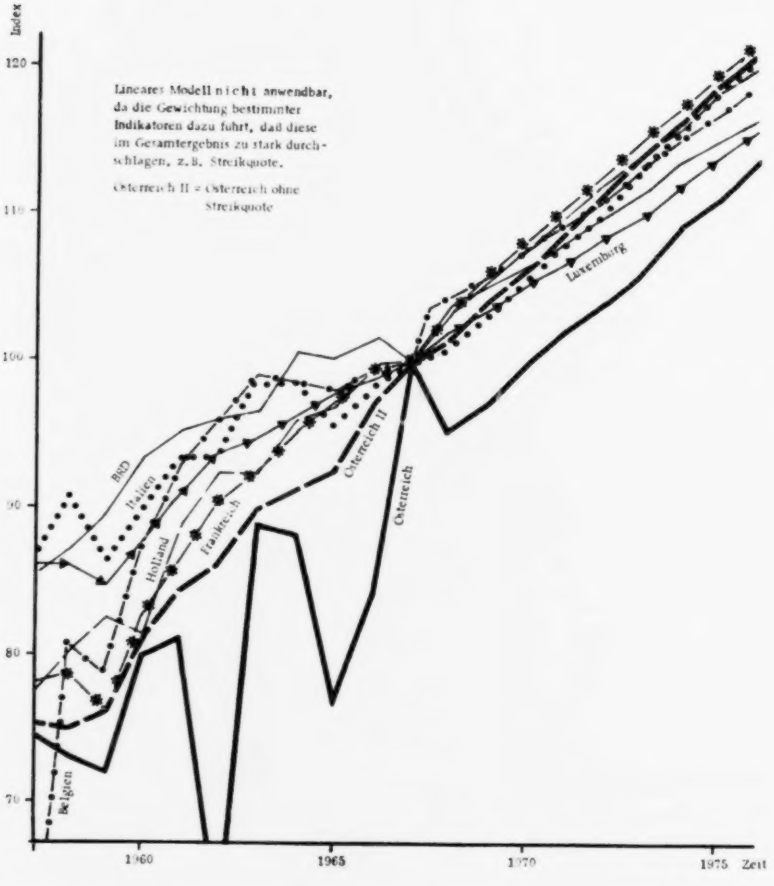

Aufwendungen für Nahrungs- und Genußmittel (ohne Getränke) in % des privaten Verbrauchs
47
42
37
32
27
22
1900
3900
5900
7900
9900
Zeit
Brutto-Nationalprodukt pro Einwohner (in DM)
Italien
Luxemburg
Holland
Frankreich
BRD
Belgien
Österreich


Aufwendungen für Getränke (alkoholische und nicht-alkoholische) in % des privaten Verbrauchs
7,0
6,2
5,4
4,6
3,8
3,0
1900
3900
5900
7900
9900
Brutto-Nationalprodukt pro Einwohner (in DM)
Frankreich
Österreich
Italien
Luxemburg
Belgien
BRD
Holland


Aufwendungen für Kleidung in % des privaten Verbrauchs
17
15
13
11
9
1900
3900
5900
7900
9900
Zeit
Brutto - Nationalprodukt pro Einwohner (in DM)
Holland
BRD
Österreich
Frankreich
Belgien
Luxemburg
Italien

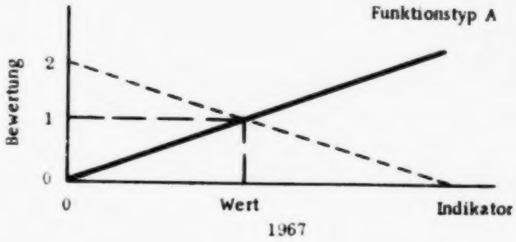

Aufwendungen für Wohnungsnutzung in % des privaten Verbrauchs
14
12
10
8
6
4
1900
3900
5900
7900
9900
Brutto-Nationalprodukt pro Einwohner (in DM)
Luxemburg
Italien
BRD
Belgien
Frankreich
Holland
Österreich

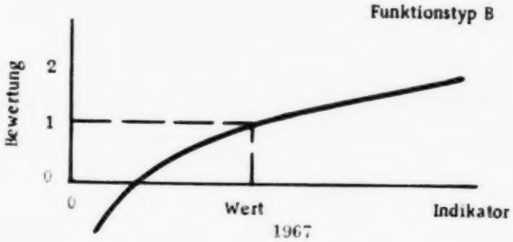

Aufwendungen für Erholung und Unterhaltung in % des privaten Verbrauchs
13
11
9
7
5
3
1900
3900
5900
7900
9900
11900
Brutto-Nationalprodukt pro Einwohner (in DM)
Österreich
Luxemburg
BRD
Frankreich
Belgien
Italien
Holland

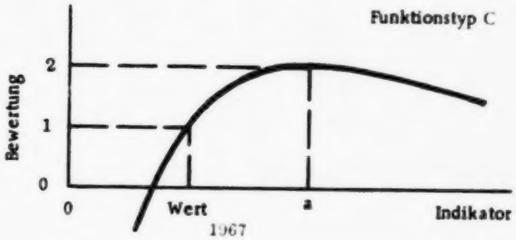


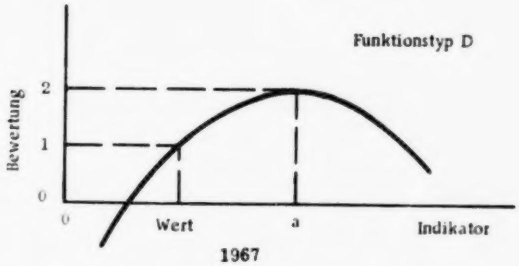
Lineares Modell **nicht** anwendbar, da die Gewichtung bestimmter Indikatoren dazu führt, daß diese im Gesamtergebnis zu stark durchschlagen, z.B. Streikquote.

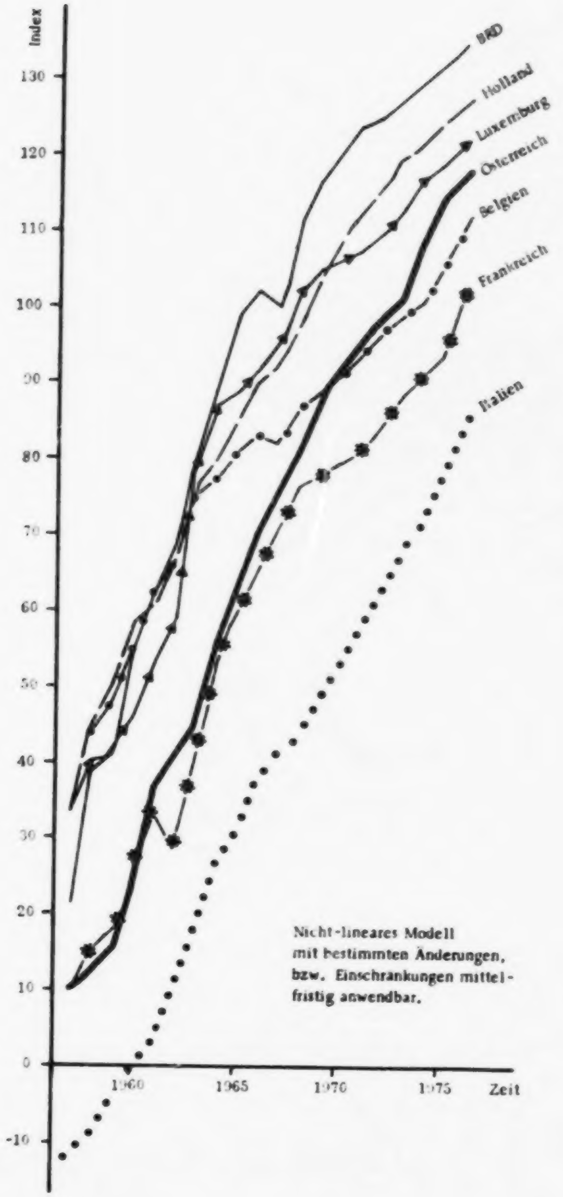
Österreich II = Österreich ohne Streikquote


Funktionstyp A
Bewertung
2
1
0
0
Wert
1967
Indikator


Funktionstyp B
Bewertung
2
1
0
0
Wert
1967
Indikator


Funktionstyp C
Bewertung
2
1
0
0
Wert
1967
a
Indikator


Funktionstyp D
Bewertung
2
1
0
0
Wert
1967
a
Indikator



Nicht-lineares Modell
mit bestimmten Änderungen,
bzw. Einschrankungen mittelfristig anwendbar.

DATA REQUIREMENTS FOR A QUALITY GROWTH POLICY

by

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Department of Planning and Economic Development
State of Hawaii

A paper presented at the 1972 annual conference of the Urban and Regional Information Systems Association and Concurrent Government Management Information Science Conference, San Francisco, California, August 29-September 2.

Data Requirements for a Quality Growth Policy

By Y. P. Joun*

1. Introduction

Increasing concern has been shown in recent years over our deteriorating *quality of life*, and uncontrolled economic growth has been singled out as one of the major culprits causing the trend. It has been argued that the magnitude of the Gross National Product (GNP) or its growth is not an appropriate measure of social welfare and, therefore, the construction of some measure of the *quality of life* index has been proposed to replace the GNP.[1] This reflects the concern that the growth of the GNP, or more precisely production and consumption of goods and services, produces external diseconomies; e.g., environmental degradations which are not subtracted from the computation of the GNP. It has been suggested, therefore, that the *quality of life* should take into account all aspects of the human environment, social and physical as well as economic. Furthermore, government has been urged to adopt quality growth rather than quantity growth policy to protect the environment and to enhance the *quality of life*.

The implementation of a quality growth policy should then require some measure of the *quality-of-life* index to monitor the effectiveness of policies aimed to improve the *quality of life*. The construction of such an index, however, is extremely difficult, if not impossible, at this time. It involves identification, compilation, aggregation, and interpretation of all variables relating to the *quality of life*. It also involves broadening the relevant data base to include not only the data on economic activities but also all other data describing the environment surrounding mankind (e.g., crime, discrimination, etc.).

Another difficulty in constructing such an index is finding an appropriate weight to aggregate these variables after all those data are identified.

The purpose of this paper is to identify the data requirements of constructing the proposed *quality-of-life* index and to discuss the problems in interpreting such an index. Also, information requirements in the construction of

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* Head, Research and Economic Analysis Division, Department of Planning and Economic Development, State of Hawaii.

[1] Population and the American Future, *The Report of the Commission on Population Growth and the American Future* (Washington, D.C.: Government Printing Office, 1972), p. 38.

so-called "socio-ecological models" will be identified and problems in interpreting the output of such models will be discussed.

The plan of the paper is as follows:

The next section will deal with the possible components of the *quality-of-life* index. Section 3 will deal with the construction and interpretation of this index. Section 4 is concerned with the information requirement of socio-ecological models. Section 5 presents conclusions.

2. Components of the *Quality-of-Life* Index

The *quality of life* encompasses all aspects of the environment surrounding human beings. Such an environment could be divided into two broad categories–human and natural environments.

Human environment is composed of the man-made environment such as economic, socio-cultural, public service, health and spatial environment.[2]

Natural environment can likewise be divided into two categories–biotic (living-organism) and abiotic (non-living-organism) components. The biotic components of the natural environment can further be subdivided into three categories–producers (or autotrophic organism); e.g., green plant, consumers (or heterotrophic organism); e.g., herbivores and carnivores, and decomposer (e.g., bacteria).[3] The abiotic component can likewise be subdivided into stock resources or non-renewable resources (e.g., fossil fuels and mineral deposits) and flow resources (e.g., solar radiation, water in the hydrologic cycle). Figure 1 shows this classification of the *quality of life*.

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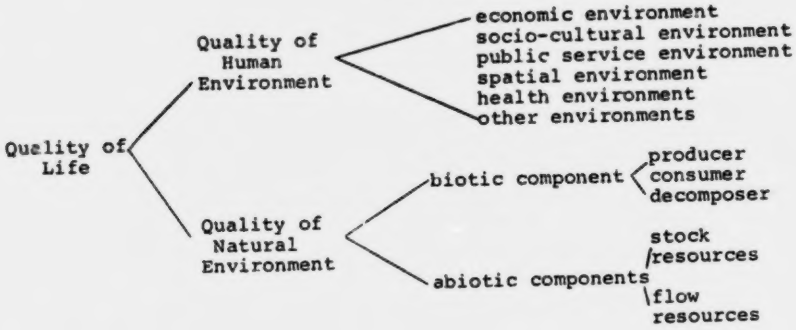
[2] This classification follows that of Perloff. See, Harvey S. Perloff, "A Framework for Dealing with the Urban Environment: Introductory Statement," in Harvey S. Perloff, ed. *The Quality of the Urban Environment* (Baltimore: Johns Hopkins Press, 1968) pp. 3-25.

[3] Walter Isard, et al, *Ecologic-Economic Analysis for Regional Development (New York; The Free Press, 1972) pp. 50-56. Stanley A. Cain, Conservation: The Developing Ecological Science of Resource Management*, Second National Congress on Environmental Health, Proceedings, 1961, pp. 56-60.

Figure 1


Quality of Life
Quality of Human Environment
economic environment
socio-cultural environment
public service environment
spatial environment
health environment
other environments
Quality of Natural Environment
biotic component
producer
consumer
decomposer
abiotic components
stock resources
flow resources

The above classification is more illustrative than completely inclusive.[4] In order to obtain an all-inclusive and precise classification, it might be useful to adopt a digital system similar to the Standard Industrial Classification (SIC) for classifying the components of the *quality of life*. Thus, "the decomposed organic matter in land" will be referred as LX 7501 and "marine bird dropping" will be designated as MX 7202.[5]

The statistics describing the economic activities are adequate if not complete. The GNP and its components are widely used and misused. One of the common misuses of the GNP (or per-capita GNP) is the attempt to use it as a measure of economic or social welfare. It is evident from our analysis that the economic environment is merely a component of *quality of life*. Furthermore, the GNP (or per-capita GNP) is not even a sufficient yardstick for measuring economic welfare. Other facets of the economic environment; e.g., the size distribution of income and wealth and other economic variables, should be considered along with the GNP in order to adequately describe the economic environment.

---

[4] According to Ayres, the basic criteria for a successful typology are: (1) that the correct classification of every entity to be classified be unambiguous (no overlap); (2) that all possible cases be covered (no gaps); (3) that the number of classes be small enough to manipulate, but large enough to permit adequate detail; and (4) that any entity should be homogeneous within the class but should be differentiated from those in other categories. See Robert U. Ayres, "A Material-Process-Product Model," in Allen V. Kneese and Blair T. Bower, ed. *Environmental Quality Analysis*, (Baltimore: Johns Hopkins Press for Resources for the Future, Inc., 1972) p. 42.

[5] Walter Isard proposes such a system for classifying ecological process. Walter Isard, et al, *op. cit.*, pp. 61-65.

There are also questions as to whether the GNP can even adequately measure the output of the economy. The problems of quality change, inability to measure adequately the output of the government sector, and other problems still plague the national income statistician.[6] The fundamental question is, however, whether a single index similar to GNP can be constructed to measure the *quality of life*.

The answer appears to be negative.[7] First of all, there are no objective ways to measure the value of non-market variables. As Arthur Okun noted, there is no way to prevent the decrease of the GNP when a bachelor marries his cook.[8] Secondly, even if we can obtain an objective evaluation of non-market variables, the aggregation of different variables to construct a single welfare index is impossible due to the impossibility of finding a suitable weight which can avoid the interpersonal utility comparisons.[9]

Other variables describing other aspects of the quality of human environment shown in Figure 1 require the knowledge of disciplines other than that of economists. However, illustrative examples will be provided to facilitate the understanding of the classification.[10]

The socio-cultural environment includes variables such as cultural experience, democratic process, and individual equality; the public-service environment, welfare services, and education; the spatial environment, quality of the housing stock, arrangement of work and a residential center, community-neighborhood environment, and traffic congestion; the environment for health care, medical care and other health services. Examples of components of natural environments are previously given.

3. Construction of the *Quality-of-Life* Index

Supposing the relevant variables relating to the *quality of life* are identified, classified and compiled. How shall those be presented to describe or monitor the changes in the *quality of life*?

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[6] "The Economic Accounts of the United States: Retrospect and Prospect," *Survey of Current Business*, 50th Anniversary Issue, Vol. 51, No. 7, Part II, July 1971.

[7] Edward F. Denison, "Welfare Measurement and the GNP," *Survey of Current Business*, Vol. 51, No. 1, January 1971, pp. 13-16 and 39.

[8] Arthur Okun, "Social Welfare Has No Price Tag," in "The Economic Accounts of the United States: Retrospect and Prospect," *op. cit.*, p. 131.

[9] This point will be discussed further in the next section.

[10] Harvey Perloff, *op. cit.*

One approach is to present a set of such variables without attempting to aggregate them. These are commonly called social indicators.[11] This approach has several advantages. First, it avoids the *impossible problem* of aggregation by presenting each *quality-of-life* component separately. For example, the pollution levels in air or water can be represented by physical units of pollutants; whereas, the economic environment such as per-capita income can be represented by dollar values. Secondly, social indicators in contrast to social accounts *need not be comprehensive*. A set of variables selected as social indicators, therefore, is merely a selective representation of different aspects of the *quality of life*. Thus, it lessens the data shortage problem.

Social indicators, however, pose the problem of interpretation. Since most of the variables selected represent different aspects of the *quality of life*, a question arises on the interpretation of the overall *quality of life* when there are divergent trends among variables selected as social indicators. For example, the improvement in the water pollution indicator level accompanied by the increase of unemployment as a result of shutdown of a pollution generating factory could be difficult to assess in judging its overall *quality of life* impact.

This kind of divergent trend in social indicators cannot be avoided since most of the variables in the eco-system are interrelated. The decreased use of pesticides, for instance, will result in a beneficial ecological impact on the wildlife but, at the same time, will adversely affect the quality and quantity of agricultural crop production.

The various interrelations and trade-offs of variables contained in social indicators make it necessary to introduce subjective values and bias in utilizing it in assessing the overall *quality of life*.

The difficulties of constructing the aggregate *quality-of-life* index have already been discussed. The difficulty of obtaining an objective measurement of the value of non-market variables and impossible task of finding objective weights to aggregate different components of the *quality of life* are main reasons which prevent us from constructing such an index. One way to lessen such difficulties is to construct a *quality-of-life* index for a well-defined homogeneous group of people; e.g., the *quality-of-life* index for the middle-aged middle-class urban caucasian male wage earners.[12] Even if the *quality-of-life* index is constructed for such a well-defined group, frequent surveys should be conducted to account for the changing values and aspirations of the society over the years.

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[11] John Q. Wilson, *Quality of Life in the United States—An Excursion into the New Frontier of Socio-Economic Indicators*, (Kansas City: Midwest Research Institute, 1969); Center for Urban Studies, Wayne State University, *Social Reporting in Michigan: Problems and Issues* (Lansing, Michigan: Office of Planning Coordination, Bureau of Policies and Programs, 1970); Harvey Perloff, *op. cit.*

[12] This is not an unconventional idea since the consumer price index measures only the price changes of goods and services bought by the group of the middle class, urban wage earners, although it is widely misinterpreted as an overall price index.

For example, if such an index were constructed during the 1930 depression years, the economic variables should have been given a dominant *weight* whereas, the weight for social environment variables should have increased during the 1960s "Great Society." It appears now that the weights for natural environment variables are on the upward surge, and should, therefore, be given *heavier weights*. Such changes in weights should not be regarded as strange since the consumer expenditure surveys are also periodically conducted to update the weights for the consumer price index. Such a survey could be held at the time of major election to find out the changing values and aspirations of the people.

4. Data Requirements for Socio-Ecological Models

In view of the difficulty of constructing an objective *quality-of-life* index, attempts have been made in recent years to construct "socio-ecological models" to study the interrelationships and trade-offs among socio-economic-ecological variables.

Isard proposes an interregional economic-ecologic input/output table to describe the interrelationships among economic and ecological variables.[13] The proposed table resembles the ordinary inter-regional input/output table in that several regional input/output tables are combined to show their interrelationships. However, the delineation of regions in the proposed table is not based on the economic factors but on the ecological processes and environmental conditions.

The proposed table contains three main regions based upon similarities of environmental conditions; i.e., land, marine, and air. The three regions are further subdivided into several zones, each having a high degree of homogeneity in terms of geographical location and ecological processes.

For instance, the marine region is subdivided into open water and intertidal subregions. In turn, each of these subregions is "further subdivided into zones of similar environmental conditions, depending on the requirements of the particular problems being investigated.[14] Each zone also contains economic and ecologic sectors. The economic sector contains the normal classification of industries found in the usual input-output table, e.g., agriculture, manufacturing, services, etc. The ecologic sector in each zone contains both biotic and abiotic categories, e.g., plants, animals, climate, geology, physiography, hydrology, soil, etc.[15]

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[13] Isard, *op. cit.*

[14] Isard, *op. cit.*, p. 59.

The proposed table shows the overall linkage of the economic and ecologic systems, and also provides a convenient framework to collect the data because of its consistent classification system. Simulation and projection describing the relationships among economic and ecologic variables could be performed utilizing the proposed table. However, many economic-ecologic processes and their relationships are not linear and, thus, make it necessary to rely on the various types of appropriate side computations and operations on the data of the non-linear part of the table.

One useful model which complements Isard's global table is the material-process-product model (MPP).[16] The model provides a detailed knowledge of the specific physical and chemical processes that occur in the production and use of goods for a certain sector of the economy.

Although a global model describing the movements of physical materials through the economy as proposed by Kneese and Ayres could be useful, a detailed micro process-production model by each industry would be more useful in obtaining the quantitative information on the relationships among the various types of residuals, the amount of output produced, and the amount and quality of inputs used.[17] Also, such a model could provide detailed technical and economic information on the alternative production process of a certain industry. For example, a detailed material-flow diagram in cane sugar processing[18] could provide the following technical information on the daily residual discharge per unit of sugar production for alternative production processes:[19]

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[15] *Ibid.*, p. 60.

[16] Robert U. Ayres, *op. cit.*, pp. 35-68. Also, Robert U. Ayres and Allen V. Kneese, "Pollution and Environmental Quality," in *The Quality of the Urban Environment, op. cit.*, pp. 35-74. "Production, Consumption and Externalities," *American Economic Review*, June 1969, pp. 282-313.

[17] See, Clifford S. Russell and Walter O. Spofford, Jr., "A Quantitative Framework for Residuals Management Decision," *Environmental Quality Analysis, op. cit.*, pp. 115-179.

[18] Kneese and Ayres give the example of material flow diagram in beet sugar production. See, *Environmental Quality Analysis*, p. 59 and *Quality of Urban Environment*, p. 54.

[19] I am indebted to Dr. Richard Marland, Interim Director, Office of Environmental Quality Control, State of Hawaii, for providing the information.

a. Gallons of waste water.

b. Five-day "biological oxygen demand" or BOD (pounds per ton of cane processed).

c. COD or "chemical oxygen demand" (pounds per tons of cane processed).

d. Suspended solids (per ton of cane processed).

e. Dissolved solids (pounds per ton of cane processed).

f. PH.

g. Total and fecal Coliform count.

h. Pesticides and herbicides (PPM).

i. Phosphate, nitrodes, and ammonia (PPM).

j. Soil particles (pounds per ton of cane processed).

k. Temperature of waste water as it enters receiving waters, and profile of ambient temperature of receiving water unaffected by waste water.

l. Extent of presence of each of the following (grams per ton of cane processed):

    (1) Hexane–extractable facts, greases and oils

    (2) Heavy materials (Hq, Pb, Cd, etc.)

    (3) Other toxic cations.

m. Sucrose (pounds per ton of cane processed).

Such detailed technical information would enable economists to study the trade-offs and make a cost-benefit analysis of alternative production processes. This kind of analysis provides more useful information than does macro cost-benefit analysis and, therefore, increases our options in dealing with environmental problems.

After an MPP model, which links the physical flow of goods to the economic activities, is constructed, we need a mathematical model which simulates the natural system of a given region (or dispersion and diffusion models), in order to assess the quantitative impact of alternative environmental control measures. Without such natural system models, e.g., hydrological and meterological model, socio-ecological models would not provide sufficient information on the precise geographical distribution of environmental impacts.

As it was discussed, a clean physical environment alone could not insure an acceptable *quality of life*. Other economic and human conditions; e.g., adequate housing, education, an efficient transportation system, and availability of cultural experiences, should be taken into account in formulating any quality-growth policy. The socio-ecological models, however, provide necessary information in formulating such a quality growth policy which must maintain a delicate balance among economic, social, and environmental variables.

In order to study the feedback relationships among various variables, a global model relating different sub-models describing different components of *quality of life* could be constructed. Such models have been used to study the effect of population increase on public health, crime and violence, changes of climate, agriculture, transportation, education, city service, and taxation.[20] Also, as it is well known, ambitious world-wide models which study the global system of feedback relationships among basic variables–population, capital, food, nonrenewable resources, and pollution–were recently released to the public to simulate the future of mankind.[21]

Such global models, although interesting, are still at a preliminary stage and the validity of these models is not yet established. They lack both theoretical foundation and the empirical verification of relationships assumed in the model. Much of the hypotheses and causal relationships described in the model are not yet well established.[22] More theoretical work as well as empirical evidence is required to build such a global model.[23] However, a socio-ecological model for a small and well-defined geographical area, such as Hawaii, or Plymouth Bay, Massachusetts, could be constructed with the present state of the art. Such a model, moreover, could provide very useful information for local planning.

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[20] Kenneth Watt, et al, *A Model of Society*, Environmental Systems Group, Institute of Ecology, University of California at Davis, 1969. M. A. Goldberg and C. S. Holling, *The Vancouver Regional Simulation Study, 1970-71*, Resource Science Center, The University of British Columbia, Vancouver, Canada.

[21] Donella H. Meadows, et al, *The Limits to Growth*, (New York: Universt Books, 1972). Jay W. Forrester, *World Dynamics* (Cambridge, Massachusetts: Wright-Allen Press, 1971).

[22] Young P. Joun, "Information Requirements for Socio-Ecological Models," *The Annals of Regional Science*, Vol. V, No. 1, June 1971, pp. 25-32.

[23] See James N. Gray, et al., "A Critique of Forrester's Model of an Urban Area," *IEEE Transactions on Systems, Man, and Cybernetics*, Vol. SMC-2, No. 2, April 1972. Their criticism is directed more to Forrester's *Urban Dynamics* but the basic criticism still applies to similar models.

In the case of Hawaii, extending the present State planning models[24] by adding material-process-production and natural systems models would allow study of a quality growth policy. Once it is constructed, such models would answer questions relating to the formulation and implementation of a quality growth policy. For example, they could be used in studying the quantitative impacts of uncontrolled growth of automobiles, population, and hotel rooms, etc. Conversely, the effects of various environmental-control measures (e.g., limitation of private automobile ownership, in-migration, and hotel construction) on the economy can be assessed utilizing such models.

Technical difficulties of interpreting the result of such policy simulations still exist due to the instability of the parameters of such models. However, policy simulations can be performed if different assumptions on the future change in technology and legal requirements are made. This is especially true in the area of environmental-quality management systems. For example, the environmental effects of uncontrolled automobile growth can be studied under the various assumptions on the future technology of the internal combustion engines and required air-pollution standards.

5. Conclusion

The *quality-of-life* concept has been defined, and the difficulty of constructing an index describing the *quality of life* has been discussed. It has been proposed that a measure of *quality of life* should include all aspects of the environment, both physical and human, although the weights of different components could change reflecting the value and aspirations of mankind.

Social indicators could be useful in monitoring the progress or lack of progress of *quality of life*, thus, providing information on the progress of established quality-growth policies. However, social indicators cannot adequately describe the condition of the overall *quality of life* due to the difficulty of interpreting divergent trends of variables included as social indicators.

Socio-ecological models provide a useful framework for collection, compilation, and interpretation of variables relating to the *quality of life*. Also, the interrelationships and trade-offs among components of *quality of life* can be studied utilizing such a model. Although the accuracy of global models is subject to discussion, a regional model for a small and well-defined area such as Hawaii could be very useful in assessing the environmental impact of various government policies aimed to achieve quality growth. It is hoped that empirical studies leading to socio-ecological models could begin in the near future in order to provide the quantitative information required for formulating a quality-growth policy.

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[24] The State of Hawaii Planning Models include population, economic, land use, and transportation models. *State of Hawaii General Plan Revision Program* in Six Parts, Department of Planning and Economic Development, State of Hawaii, 1967.

References

Ayres, Robert U. and Kneese, Allan V., "Production, Consumption and Externalities," *American Economics Review*, June 1969.

Ayres, Robert U., "A Material-Process-Product Mode," in Allen V. Kneese and Blair T. Bower ed. *Environmental Quality Analysis*, (Baltimore: Johns Hopkins Press for Resources for the Future, Inc. 1972).

Cain, Stanley A., *Conservation: The Developing Ecological Science of Resource Management*, Second National Congress on Environmental Health, Proceedings, 1961.

Center for Urban Studies, Wayne State University, *Social Reporting in Michigan: Problems and Issues*, (Lansing, Michigan: Office of Planning Coordination, Bureau of Policies and Programs, 1970).

Denison, Edward F., "Welfare Measurement and The GNP," *Survey of Current Business*, Vol. 51, No. 1, January 1971.

Forrester, Jay W., *World Dynamics*, (Cambridge, Mass.: Wright-Allen Press, 1971).

Goldberg, M.A. and Holling, C.S., *The Vancouver Regional Simulation Study, 1970-71*, Resource Science Center, the University of British Columbia, Vancouver, Canada.

Gray, James N., "A Critique of Forrester's Model of An Urban Area," *IEEE Transactions on Systems, Man, and Cybernetics*, Vol., SMC-2, No. 2, April 1972.

Isard, Walter et. al., *Ecologic-Economic Analysis for Regional Development*, (New York: The Free Press, 1972).

Joun, Young P., "Information Requirements for Socio-Ecological Models," *The Annals of Regional Science*, Vol. V, No. 1, June 1971.

Meadow, Donella H. et. al., *The Limits to Growth*, (New York: University Books, 1972).

Perloff, Harvey S., "A Framework for Dealing with the Urban Environment: Introductory Statement," in Harvey S. Perloff, ed. *The Quality of the Urban Environment*, (Baltimore: Johns Hopkins Press, 1968).

Population and the American Future, *The Report of the Commission on Population Growth and the American Future*, Washington, D.C.: Government Printing Office, 1972).

Russell, Clifford S. and Spofford, Walter O., Jr., "A Quantitative Framework for Residual Management Decision," in Allen V. Kneese and Blair T. Bower ed., *Environmental Quality Analysis: Theory and Method in the Social Sciences*, (Baltimore: The Johns Hopkins Press for Resources for the Future, Inc., 1972).

State of Hawaii General Plan Revision Program, Department of Planning and Economic Development, State of Hawaii, 1967.

"The Economic Accounts of the United States: Retrospect and Prospect," *Survey of Current Business*, 50th Anniversary Issue, Vol. 51, No. 7, Part II, July 1971.

Watt, Kenneth, et. al., *A Model of Society*, Environmental Systems Group, Institute of Ecology, University of California, Davis, 1969.

Wilson, John Q., *Quality of Life in the United States - An Excursion into the New Frontier of Socio-Economic Indicators*, (Kansas City: Midwest Research Institute, 1969).

III *QOL*: ENVIRONMENTAL PERSPECTIVES

WHY ENVIRONMENTAL QUALITY INDICES?

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WHY ENVIRONMENTAL QUALITY INDICES?

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Science and technology in general, and professionalism in particular, are under attack in our great nation. The average American citizen is confused and confounded by purported scientific rationales that mix philosophy, politics, and opportunism with the analysis of factual research data. That confusion turns to disgust, and then rejection, when the public listens to professionals trained in our best institutions of higher learning with similar long-term experience who come forth with diametrically opposed conclusions and recommendations from an analysis of environmental research data. Unfortunately, there appears to be a growing conviction among the American populace that it is extremely difficult if not impossible to get the unvarnished truth from the scientific community. As a consequence, professionalism is being downgraded in direct proportion to the inability of the public to guess which scientist has the right answer. Nowhere is there a better example of this phenomenon and dilemma than in an analysis of the current environmental–ecological revolution. In February, 1969, the National Wildlife Federation commissioned the Gallup Organization to survey public opinion on environmental degradation.[1] Gallup found that the majority of Americans were either somewhat or deeply concerned about the deteriorating quality of living brought about by the fouling of our own nests. Both fortunately and unfortunately, many and varied segments of our modern complex society have also become aware of this burgeoning public interest. It has brought forth new pollution abatement laws replete with political tub thumping, a new dimension to more intense and centralized government regulation, an alarmed industrial complex–insecure in its continued ability to pollute at the expense of the environment, the Madison Avenue hucksterings of endless products reportedly harmless to the plant and animal ecosystems, and a citizenry that is incapable of separating advertising fantasyland from the truth. Extremist "eco-freaks" and a rash of instant ecologists whose dire predictions have failed to materialize have created a king-size environmental credibility gap that threatens to destroy any significant progress towards the real solution of our critical environmental problems.

Government leadership has been a great disappointment. Whenever government finds itself in the middle of two aggressive constituencies with conflicting viewpoints, its reflexes are predictable. Instead of concentrating on an aggressive action program based upon the best scientific evidence available, government usually embraces one of two cop-outs: (1) a proposal for government reorganization is drafted or (2) a commission is appointed for further study. Both of these inept measures usually take years to complete, and neither effort has ever made any great contribution to the solution of a problem. Then there is a Congressional propensity to place in the same federal executive agency the mandate to both promote and regulate a specific important natural resource. The best examples are: the Atomic Energy Commission, which possesses the authority both to promote and to regulate the peaceful uses of atomic energy, and the Federal Power Commission, with authority to promote and regulate the energy needs of our nation. The Commerce Department is industry's spokesman in governmental affairs. Agriculture promotes and regulates the farmer and the commodities he produces. The entire executive branch of our federal government (and also to a lesser degree in state government only because of size) is rapidly losing the confidence of increasingly larger segments of our society because of its apparent willingness to react to principal special interest lobbies while unable or unwilling to respond to majority public opinion or to take the responsive actions essential to resolving critical issues.

The seniority system in our Congress perpetuates rules which essentially place in the hands of an individually powerful committee chairman the authority to prevent the entire Congress from considering, debating, and voting on critically needed legislation.

By now everyone should be convinced why we need Environmental Quality Indices. The lay citizen is interested in preserving and perpetuating a quality life in a natural environment in addition to keeping our nation strong, healthy, and secure from our enemies, both foreign and domestic, by preventing the misuse and waste of our great wealth of resources. The effort is now entering a crucial stage. The conservation, environmental, and ecological forces have been and are anxious to continue the battles which shape our national priorities. The man on the street must be armed with the facts and figures he considers accurate and has confidence in if we expect him to enter the fray with any significant firepower. The NWF's Environmental Quality (EQ) Index[2,3,4] is an effort designed to provide the concerned citizen with a comprehensive review of published information on factors affecting environmental quality presented in rather simple language and graphics readily understood by the masses.

While we are very proud of the innovative work done within the ranks of the National Wildlife Federation staff, we are not so foolish or short-sighted as to think that our EQ Index–now in its third year–represents the ultimate product or even the best analysis of available data. However, we do feel that it gives the average citizen a much better grasp of the environmental situation as it exists today and as it might look tomorrow and next year and in the foreseeable future.

The NWF EQ Index is the end product of an exhaustive, scholarly exercise that attempts to reduce reams of information–much of it disjointed at best and some possibly erroneous at worst–into a simple, orderly, graphical representation of environmental conditions. We are persuaded that our EQ Index enables the average reader to quickly grasp the overall environmental situation and to "zero in" on the key issues. Armed with the information contained in a comprehensive Environmental Quality Index, and the trends that it discloses, a citizen is in a position to go through the accepted democratic processes of examining the pros and cons of the issue, listening to the comments and advice of others, and eventually reflecting his views in the various forums and forces that shape our national policy.

For those of you who might not be familiar with the EQ Index prepared by the National Wildlife Federation, I will spend a few minutes outlining its major points and describing the processes by which some of the judgments are made and by which some of the costs are determined.

The National Wildlife Federation's third annual Environmental Quality Index was published in October. When first published in the fall in 1969, the EQ Index evaluated six natural resources: air, water, soil, forests, wildlife, and minerals. In 1970, a seventh item–living space–was added to the list.

The various categories of the environment were subjectively rated from best to worst and then were scored on a numerical scale of 0 to 100, as listed in Table 1. A "0" would equal death or disaster; "100" would be ideal conditions with environmental equilibrium. For example, soil is, in our relative judgment, in the best condition of any single resource, but soil conditions are still far less than ideal. In 1970, it was given an Index value of 80. This year, because of continuing losses, the rating slipped to 78. Air is the natural resource that is in the worst shape. It actually poses a danger to human health in many cities. The 1970 Index was placed at 35. Continuing pollution reduced this to 34 in 1971.

Table 1. Evnironmental Categories and Ratings

Category	1971 Score
Soil	78
Timber	76
Living space	58
Wildlife	53
Minerals	48
Water	40
Air	34

Next, the seven elements were assigned a relative importance value expressed as a percentage. Some elements such as air, water, living space, and soil for food are essential to life and must necessarily be assigned a higher value. Table 2 shows our evaluation of relative importance.

Table 2. Environmental Categories and Relative Importance

Category	Relative importance
Soil	30
Air	20
Water	20
Living space	12.5
Minerals	7.5
Wildlife	5
Timber	5
	100%

Table 3. Development of National EQ Index

Category	1971 Score	Relative importance	EQ Points
Soil	78	30	23.4
Air	34	20	6.8
Water	40	20	8.0
Living space	58	12.5	7.25
Minerals	48	7.5	3.6
Wildlife	53	5	2.65
Timber	76	5	3.80
		NWF National EQ Index:	55.50

To develop the EQ points for the comprehensive, overall index, the 1971 score for each category is applied to this percentage figure. Table 3 shows how our 55.5 National EQ Index was developed.

Quite obviously, a number of value judgments were arbitrarily made. These, in turn, led to the conclusions presented in the EQ Index. Our judgments and conclusions were necessarily subjective, but while we consider these judgments scrupulously fair, they are subject to challenge. In fact, we are hopeful the scientific community can help in eliminating those judgments which have insufficient back-up data by filling in the gaps in our body of knowledge about the biosphere in which we live.

Since trends are the important things, I think you would be interested in knowing what they are in the various environmental categories. You will note that only in the categories of water and timber have we made any gains since last year.

Soil quality has dropped from 80 to 78 with haphazard land development. Timber quality has risen slightly from 75 to 76 as growth exceeds cut. Living space quality has fallen to 58 from 60 as more people crowd into less space with more pollution. Wildlife quality has dropped to 53 from 55 as more and more habitat is converted to those uses adverse to wildlife. Minerals have slipped from 50 to 48 as we use up minerals and fossil fuels faster than we find them. Water quality is holding steady at the intolerably low level of 40 as we continue to develop tougher legislation but expend capital for physical plants only to the level of preventing further deterioration of water quality. Air quaility–our most serious problem–continued to drop from 35 to the shockingly low level of 34 with more autos and more industrial pollutants. The overall trend shows a decline from 57 in 1970 to 55.5 in 1971.

The costs of pollution with respect to health, vegetation, materials, esthetics, and property values must be highlighted in any worthwhile EQ Index, because eventually the entire decision-making process evolves to the point where the cost of pollution versus the cost of pollution control or abatement must be addressed head on. Before reasonable decisions can be made, the public must have an understanding–or at least an appreciation–of what the costs are of abating or controlling the various forms of pollution, and more importantly of what the benefits are both in economics and esthetics that will accrue to the individual if pollution is controlled. Armed with such factual data–even if it has been oversimplified and generalized by being incorporated in an EQ Index–the average citizen is in a position to vote more intelligently on pollution issues.

The average annual cost of air pollution in the United States ($16.1 billion) has a clear impact on the average taxpayer's purse (Table 4). Table 5 brings together a wealth of water pollution facts and figures in a forceful presentation of the price tag ($42.3 billion) attached to clean water.

We rely heavily on governmental agency reports, press conferences, and statements made by key government officials before Congressional committees and public groups to arrive at our rankings, individual scores, and relative importance. As part of our Annual EQ Index, we now publish a "Reference Guide" which is keyed directly to statements made in the EQ Index.[5] By checking the Reference Guide, one can quickly determine the reports, tabular data, and statements that contributed significantly to the final form taken by each of the seven environmental factors. A great many of our statistics are obtained from the Environmental Protection Agency and the Council on Environmental Quality. In particular, the CEQ's Annual Report on Environmental Quality is probably our single most important source of factual data.

In summary, it is in the great American tradition for the American people to work their will through our democratic institutions. Through the processes of public hearings, forums, educational systems, and mass media, the citizen can examine positions and attitudes and make judgments. Decisions should be made by a fully informed citizenry with cost-benefit ratios, alternatives, options, and

Table 4. Dirty Air Costs

Source of cost	Total cost ($$10^9$)	Cost for average family ($)
Cost to human health	6.1	117
Cost to residential property	5.2	100
Cost to materials	4.7	90
Cost to vegetation	0.1	2
Total	16.1	309

Table 5. The Price Tag For Clean Water

Source of improvement	Cost ($$10^9$)
Municipal waste treatment plant construction costs	
Primary and secondary treatment	8.7
Tertiary treatment	3.9
Operation and maintenance	4.5
Industrial abatement costs	
Nonthermal	3.2
Reduce thermal pollution	2.0
Operation and maintenance	4.0
Interceptor and storm sewer improvement costs	7.4
Sediment control and acid mine drainage reduction costs	6.6
Reduction costs for oil spills, water crafts discharge, and miscellaneous	1.0
Added reservoir storage for low flow augmentation	1.0
Total	42.3

trade-offs placed before them for consideration. Decisions affecting the quality of individual living should not be made solely by industry, government, eco-freaks, doom mongers, or nationally organized environmental groups. If we reach the point where our policy decisions are made on the basis of only the powerful, organized lobbies of vested interests or we throw up our hands in confusion and lose the battles by default, our nation is in deep trouble.

In the final analysis, the people must be the arbitrators of what constitutes the good life or the decisions on trade-offs and social progress in whatever form. Without an objective EQ Index to assist them in determining with some accuracy the degree to which the environment is deteriorating, the costs, the alternatives, and the trade-offs, they cannot make meaningful judgments.

We can be pessimistic. We prefer to be optimistic. Constructive actions can be taken. Pollution can be controlled, strip-mined areas can be reclaimed, blighted urban ghettos and wide expanses of highway can be made pleasant and productive through proper planning and meaningful, forceful execution of those plans. Clear waters and clean air, green forests and fields, flights of birds, and the sight of wild creatures are among the amenities that make life worth living as compared to a mere existence.

The scientific community has an obligation to assist our decision makers in giving the American people the opportunity to choose between a denaturalized, defiled, and debased existence or a new birth of quality living complete with the preservation of objects of great natural beauty and aesthetic appeal in addition to the restitution and rehabilitation of those renewable natural resources upon which life is dependent. There are those who say science is incapable of providing the technology to clean up our polluted planet. I say the capability is there, but the willingness to devote the time, to pay the price, to establish objective standards of enquiry, and to identify pollution abatement as a high priority domestic and world problem is lacking.

There are those who advocate a no-growth, no further industrial development policy as the only solution to the environmental dilemma. While this may be a worthy objective, such an advocacy is not very realistic. The real solution lies in allocating whatever percentage of our increase in the gross national product is needed to clean up the environment. The construction of a sewage treatment plant or the development of new technology to more economically remove sulfur from coal and oil contributes jobs and additions to the GNP as much as any other productive action.

In conclusion, the question often asked is what can the scientific community contribute to an improved life style through an improved environment? First, the AAAS as the leading representative of the scientific community can help restore the credibility of the scientist and reinstate his position as the fountain of truth by immediately establishing ethics committees for the various resource disciplines. The most outstanding, objective, and respected scientists should be appointed to the committees and specifically assigned the extremely difficult but not impossible task of discerning scientific truths in the arena of conflicting analysis and viewpoint. Those scientists whose position is dictated more by the paycheck than by objectivity or those who make a conclusion and proceed to gather and consider only data that supports that conclusion should be called to an accounting before their peers.

Second, the professional resource manager should immediately embrace an advocacy role in environmental affairs. The scientist should no longer be content with publishing the methods and conclusions of a research effort or handling his working assignment. In this modern day of the activist and public participation in policy determination, the cool, calculated, objective, and expert voice of the true scientist is badly needed in molding public opinion in the proper form and in formulating guidelines that will direct our national policy towards an improved natural environment and a quality life style for all Americans.

REFERENCES

1. The Gallup Organization, Inc., The U.S. Public Considers Its Environment (conducted for the National Wildlife Federation). Princeton, New Jersey, 1969.

2. National Wildlife Federation, National Environmental Quality Index, *National Wildlife*, Aug.–Sept., 1969.

3. National Wildlife Federation, 1970 National Environmental Quality Index, *National Wildlife*, Oct.–Nov., 1970.

4. National Wildlife Federation, 1971 National Environmental Quality Index, *National Wildlife*, Oct.–Nov., 1971.

5. National Wildlife Federation, 1971 EQ Index Reference Guide, Washington, D.C.

USES OF ENVIRONMENTAL INDICES IN POLICY FORMULATION

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USES OF ENVIRONMENTAL INDICES IN POLICY FORMULATION

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Responsible decision-making in government as in other institutions depends on the availability of reliable information. In areas such as the environment, where emotions can run high, hard facts are often of critical importance. If we are to achieve effective management of our environment, we will need comprehensive data about the status and changes in the air, water, and land. Optimally, these data should be organized in terms of indices that in some fashion aggregate relevant data. At present, our measures are imperfect. The issue of potentially hazardous chemicals, particularly possible substitutes for phosphates in detergents, illustrates both the needs and gaps of information in the formulation of environmental policy.

Last summer, the Federal government was faced with making a difficult decision concerning nitrilotriacetic acid—more commonly known as NTA. In such decisions, the Council on Environmental Quality (CEQ) is consulted with respect to the environmental aspects of the problem. As is usual in many of the situations facing the Council, a determination had to be made in a relatively short time as to what sort of policy recommendation would be made on this issue.

A year or so ago when the great wave of adverse publicity about phosphates arose, NTA quickly received public attention as a possible substitute for phosphates in detergents. While possessing many of the beneficial properties of phosphates, NTA would not have the stimulating effect on eutrophication that phosphates often have. Indeed, NTA seemed like such a reasonable replacement for phosphates that at least one company, in good faith, put a sizable investment into facilities to produce NTA on a sufficiently large scale to meet the demands for their detergent products.

This is another example of our society jumping the gun on products that apparently will fulfill a consumer demand, but which have not been sufficiently investigated for their possible side effects on human health and on other areas of our environment. In the fall of 1970, investigations concerning the side effects of NTA were intensified. Just about a year ago, a review to evaluate these effects was conducted by the Public Health Service, the Environmental Protection Agency, the Office of Science and Technology, and our Council. From this evaluation, it became apparent that NTA did indeed have possible adverse side effects that should be carefully investigated before the product received widespread distribution, such as it would if used in detergents. These side effects include a possible chelating action with cadmium and other heavy metals that could result in their abnormal concentrations in human and other biological systems. NTA was also suspected of being carcinogenic.

As a result, the government did not encourage the use of NTA for widespread distribution and pressed for more intensive investigations concerning other substitutes that might replace phosphates in our detergents. The affected industries voluntarily held NTA-based detergents off the market. That was the way the situation stood in August 1971. There was continuing pressure from environmental groups to remove phosphates, even though many detergent manufacturers had already reduced the amount used in their detergents. But no clear-cut substitute for phosphates, other than NTA, was apparent. The evidence on the adverse effects of NTA was not conclusive in all aspects. On the other hand, certain manufacturers urged the approval of NTA, particularly those that had made substantial capital investments to produce it. The federal government had to make a decision on what sort of guidelines relating to this problem should be issued to industry.

It was a tough decison because reliable data were lacking and we had to rely on imperfect assessments. Ideally we should have had the following information:

1. A definitive model of how eutrophication works in aquatic bodies and the role that phosphates and other nutrients play in the different categories of these bodies, such as lakes, streams, and salt water estuaries, as well as under various conditions of hardness. Information on how to determine the limiting nutrients in each of these bodies would have been particularly useful.

2. The amount of phosphates from detergent wastes that presently gets into each of these aquatic bodies as compared to other phosphate sources and the amount that planned improvements to our industrial and municipal sewage facilities would remove.

3. The amount of phosphates that has been eliminated from discharges into our aquatic bodies due to control measures recently instituted and the resulting effect on the eutrophication process in the aquatic bodies. These controls include the voluntary measures exercised by the consumer, the controls promulgated by certain local governments such as Suffolk County in New York, and the phosphate extraction methods implemented in some sewage treatment plants.

4. The adverse effects of NTA and of NTA compounds on human health and on the other areas of the environment. Included would be the amount which could be safely emitted to the environment, that is, the threshold limit value that must be achieved before we start detecting adverse effects, in the long as well as in the short run.

5. The same adverse effects information on other possible substitutes for phosphates in detergents and the amounts of these substitutes which would have to be used in the detergents.

6. The probability for success of technology in removing phosphates, NTA and other substances of possible use in detergents from sewage, in both municipal and industrial processes, and the time required to achieve this.

7. The costs to the consumer and to the taxpayer for all the above.

A sound research program could produce part of the desired information, such as the success potential of various technological techniques to remove these phosphates and other chemicals in the sewage treatment process. However, much of it, such as the success of the controls instituted over the past two years to remove phosphates from detergents and the resulting effects on the eutrophication process in the receiving bodies of water, would have to be obtained from actual experience and the empirical data obtained from this experience. There has been in fact a substantial experience in various control schemes, but this experience has not been quantified. In the ideal situation, data on water quality would be compiled and analyzed, and the results would be presented to the federal policy formulators in the form of indices relating to water quality. These indices would assist them in their efforts to provide options concerning new policies or changes to existing policies which might be made in order to minimize the impact of man's activities on the eutrophication process.

An important feature of these indices is their assistance in showing the ability of our technology to perform the job listed in each option; the cost, both economic and social, to implement these options; and the lead time necessary to initiate these programs. Also, information on the possible incentives—for example, regulations, tax breaks, and the like—would be extremely helpful.

As you recall, the government did make a policy decision on NTA last September. It was not to foster its use, but rather to allow the use of phosphates in detergents at the lowest levels possible, provided other additives did not pose a health hazard; phosphates at that time appeared to be the "least bad" of the possible detergent additives. Our recommendation had to be made; so, based on the best of the inadequate information and expert opinions available at that time, we made it. This is not the most satisfactory method of operation, but unfortunately with the current inadequacy of data and indices in the environmental field, we must do this more often than we like.

The above example illustrates the usefulness of environmental indices to policy formulators. Other important uses are to assist the informed public in assessing how well the programs dealing with our environmental problems are progressing and to assist scientists and engineers in their development of the technology essential to solving our problems. A prime requirement for indices is that they must be in a form that is easily understood by the different groups using them. The cost of living index used to gage our economy approaches this goal. A second requirement is that the indices must be representative of the geographic area and time period which they are supposed to cover. Here a trade-off must be made between the resources and time required to obtain sufficiently representative samples and the need and timeliness of the resulting information. A third requirement is that indices must be reliable. We are uncomfortable in situations where we are dealing with tenths of a percent to indicate trends, such as for unemployment, and find out that other factors, such as seasonal adjustments, might introduce uncertainties of greater than 0.1% to the apparent values given by the index.

Another requirement is for ease in collecting the data required for the index, evaluating those which are directly representative and those which are not, correlating this data, and processing the useful data into the index. Of course, we would like to use existing information collection and analysis systems to accomplish this to the maximum possible extent.

Section 204 of the National Environmental Policy Act of 1969, which established our Council, describes one of our duties as:

> "To gather timely and authoritative information concerning the conditions and trends in the quality of the environment both current and prospective, to analyze and interpret such information for the purpose of determining whether such conditions and trends are interfering, or are likely to interfere, with the achievement of the policy set forth in Title I of this Act, and to compile and submit to the President studies relating to such conditions and trends;"

In March 1970, President Nixon in Executive Order 11514 further defined the duties of the Council in this area to:

> "Promote the development and use of indices and monitoring systems (1) to assess environmental conditions and trends, (2) to predict the environmental impact of proposed public and private actions, and (3) to determine the effectiveness of programs of protecting and enhancing environmental quality."

This amounts to quite a challenge when we examine all of the activities of man which have effects on the environment. In many of these areas, there is a great deficiency in the data which we need for determining and understanding these effects. In others, there is an overabundance of data—so much that we do not have the capability to process and interpret it. These data, such as that from some satellites which continuously accumulates on magnetic tapes and cards and fills up vast volumes of valuable storage space, contribute to the growth of a new type of pollution–information pollution. We have got to make sure that the data we collect are data which we can efficiently use and which will not saturate our collection and analysis systems. We must take a hard look at existing systems to insure that they meet this requirement. We must design future collection and analysis systems to achieve this end.

As a first step in building a national environmental monitoring system, the Council commissioned a contractor in the summer of 1970 to develop a system design concept for monitoring the environment of the nation. His final report was rendered in April 1971 and had been commented on by other federal agencies and public groups. The report provided us with certain recommended indices to represent the state of the environment, described the data needed to derive these indices, reviewed current monitoring programs, and considered the alternative methods to obtain and utilize these data. The contractor developed a system to evaluate the indices' environmental impacts, utility, and cost and used it to obtain a relative priority ranking of each index. Although many of the value judgments had to be made arbitrarily, the report performed a real service in giving us something to constructively criticize, whereas before we had nothing.

One of our Council's primary interests is to develop environmental indices that assist in policy formulation and that also inform the general public on the state of the environment and how it has changed over time. We would like to come up with a system similar to that of the Council of Economic Advisors in which indices such as the cost of living index, the unemployment index, and the gross national product provide information on the state of our economy. However, we do not feel that we have sufficient knowledge at the present to define what overall indices we need to represent the total environment. To obtain a better handle on this problem, we are now concentrating on a few selected areas of the environment and are developing detailed indices along with the pertinent reliability factors for these areas.

The six areas which we have selected are air pollution, water pollution, land use, recreation, wildlife, and pesticides. The Council has a contractor in each of these areas who is working with the appropriate federal agencies. Federal agencies in general have most of the available data which might be used as input for indices; however, agencies now generally use this data for different purposes. The available data must be identified, methods of aggregation developed, and procedures established for a continuing effort. These tasks are the responsibilities of the contractors. After the due date of the contractor reports on April 15, we plan to go directly to the pertinent agencies and ask that they improve and, at periodic intervals, update these indices. Also, we hope that these will form the nucleus around which to build the system of indices in other environmental areas so as to eventually have a set of indices that will fulfill the needs of the national policy makers and of the informed general public.

A year ago, a new agency—the Environmental Protection Agency (EPA)—came into being. EPA is the pollution control policeman of the federal government.

EPA fulfills the role of establishing criteria and necessary standards pertaining to environmental issues and of seeing that the measures to implement these standards are promulgated and enforced. In conjunction with the other federal agencies, EPA now provides us with the constructive antagonist–protagonist ingredient in environmental matters. Historically, this ingredient has played a key role in so successfully shaping our country's policies in other vital areas.

With EPA on the scene, it is quite logical that it should play a major role in establishing the environmental monitoring and information system. It assumed control of some good monitoring systems as a result of the agencies which come under its control in the federal reorganization which created EPA. These include the National Air Sampling Network from the old National Air Pollution Control Administration and the Pasteurized Milk Network, to monitor several radionuclides, from the old Bureau of Radiological Health of the Department of Health, Education, and Welfare.

EPA is now in the process of integrating the monitoring systems that it inherited, along with the information output from the systems of other agencies, into a form best suited to its mission. It could presently use the data from environmental monitoring systems to accomplish the following:

1. To help enforce environmental quality standards for air, water, radiation, pesticides, and solid wastes.

2. To develop new standards and refine existing standards.

3. To analyze and report the early buildup of hazardous pollutants.

4. To ascertain whether segments of the environment are improving or declining in quality from one time frame to the next.

5. To assist the Executive Branch in establishing priorities for environmental work and in deriving the cost and benefits of alternative EPA actions.

I think we all realize that we cannot separate environmental considerations from the activities of all agencies in the government and create one superagency to deal with just this task alone. If we did, there would be very little work left for the other agencies since environmental considerations enter into just about everything we do. So, through the environmental impact statement mechanism which was established by the National Environmental Policy Act, all agencies are required to consider environmental factors as an integral part of their actions. Until two years ago, the main considerations in agency actions had been the mission, available technology, and the cost. Now a fourth major consideration has been added—the environment.

As I mentioned earlier, the federal government has a number of existing agencies that are working on environmental problems and that have developed monitoring and information systems applicable to this work. An example is the surface water monitoring network developed by the U.S. Geological Survey in the Department of the Interior. We do not have the resources to build a new environmental monitoring and information system from scratch. We must make use of the systems which have been developed by other agencies of the federal government, like the USGS network. Of course, most of these systems were developed to focus on just one medium or pollutant, whereas the effects of pollutants on man and on the rest of the environment come from a combination of pollutants traveling through several media. Quite often synergistic effects and processes create byproducts that are even more harmful than the original substance itself. An example of the latter is methylmercury, which many think is produced in marine sediments from man's disposal of metallic mercury. This methylmercury has a much higher absorption factor in the human body than does the metallic mercury and hence is much more dangerous to human health when it enters the human food chain from these aquatic areas.

We must insure that the existing federal assets are used more efficiently. To help achieve this, the Office of Science and Technology sponsored a study on Environmental Quality Information and Planning Systems, commonly known as SEQUIP, in the year preceding May 1971. This study has fairly well identified what the present assets of the federal government are in the information field relating to the environment. This is indeed a valuable contribution to the present CEQ and EPA efforts.

To summarize my remarks, we need better and more reliable data to understand the effects of man's activities on the environment and to determine what possible things we might do to ameliorate the adverse effects. This data must be presented in abbreviated but meaningful form to policy and decision makers, to the informed general public, and to scientists and engineers so that all three groups may understand them and make use of them in fulfilling their respective roles in preserving and enhancing the quality of our environment. Our Council makes policy recommendations to decision makers and coordinates efforts in the field of the environment among federal agencies. We need indices covering the whole spectrum of environmental activities as soon as possible so as to make our recommendations more meaningful and more reliable. These indices will assist us to define the various options involved in policy decisions, to include their economic and social cost and their implications on other activities, and to assess the success of present policies in dealing with some of these problems.

A DESCRIPTION OF AN ENVIRONMENTAL EVALUATION SYSTEM*

By

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A DESCRIPTION OF AN ENVIRONMENTAL EVALUATION SYSTEM

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INTRODUCTION

The environment represents the most complex system known to man for it truly represents the complete set of resources, physical and biological, that exist on earth, as well as the infinite interactions that occur among this set of resources.

An environmental evaluation system (EES), to be practical and effective, must greatly simplify the environment into a relatively small number of measurements and indicators that can be used to determine whether or not a proposed water development project has a significant impact upon the environment. An EES, to be of value, must be comprehensive and broad enough to include all relevant types of environmental measurements and indicators as determined through an interdisciplinary perspective. An EES, to be utilized in the water resources planning process, must be structured in an orderly and systematic framework that will enable replication from project to project and yet be flexible enough to be useful over a wide range of water resources development alternatives. In short, an EES must be an analytical tool that strikes a balance between too little detail and too much detail–a tool that can be valuable in the water resources planning process if used intelligently and honestly.

This chapter describes the structure, content, and values of the EES that the Battelle–Columbus research team has developed for the Bureau of Reclamation. In the judgment of the research team, the system presented on the following pages best meets the condition ascribed by the Bureau at the outset of this project and will meet the needs of the Bureau in being responsive to the National Environmental Policy Act of 1969.

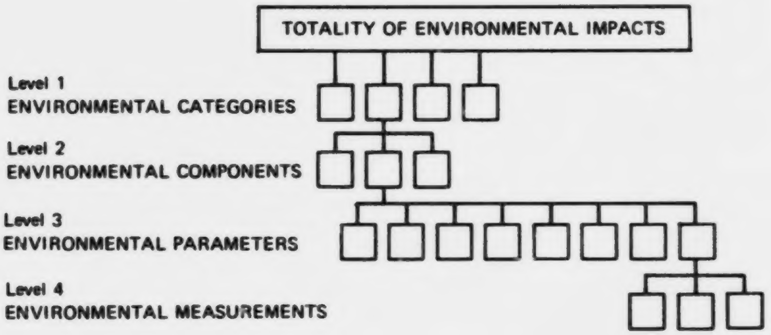
STRUCTURE OF ENVIRONMENTAL EVALUATION SYSTEM

To simplify the structure of the EES, terms at four levels of generality are used as follows:

Level 1–Most general terms	ENVIRONMENTAL CATEGORIES
Level 2–Intermediate terms	ENVIRONMENTAL COMPONENTS

Level 3–Specific terms	ENVIRONMENTAL PARAMETERS
Level 4–Most specific terms	ENVIRONMENTAL MEASUREMENTS

These terms are arranged in a hierarchical order within the EES as follows:


TOTALITY OF ENVIRONMENTAL IMPACTS
Level 1
ENVIRONMENTAL CATEGORIES
Level 2
ENVIRONMENTAL COMPONENTS
Level 3
ENVIRONMENTAL PARAMETERS
Level 4
ENVIRONMENTAL MEASUREMENTS

However, as an overview to understanding the entire system, it should be recognized that the ENVIRONMENTAL PARAMETERS are the key level within the system. The system has been designed so that each parameter represents–on its own–*a unit of environmental significance worthy of separate consideration*. Thus, a major change in any single parameter represents a "red flag" of environmental significance that requires detailed attention during the planning of a water resources project.

The EES is designed with 4 environmental categories, 17 environmental components, and 66 environmental parameters. Each parameter is then defined according to one or more specific measurement, as appropriate.

CONTENT OF ENVIRONMENTAL EVALUATION SYSTEM

Each of the environmental categories, components, and parameters will be discussed separately later in this section. To put the entire system in perspective prior to this discussion, all of the elements within the system are presented below.

Environmental Categories

I. ECOLOGY
II. ENVIRONMENTAL POLLUTION
III. ESTHETICS
IV. HUMAN INTEREST

Environmental Components

I. ECOLOGY
- (A) Species & Populations
- (B) Habitats & Communities
- (C) Ecosystems

II. ENVIRONMENTAL POLLUTION
- (D) Water Pollution
- (E) Air Pollution
- (F) Land Pollution
- (G) Noise Pollution

III. ESTHETICS
- (H) Land
- (I) Air
- (J) Water
- (K) Biota
- (L) Manmade Objects

IV. HUMAN INTEREST
- (N) Education-Scientific Significance
- (O) Historical Significance
- (P) Cultural Significance
- (Q) Mood-Atmosphere Significance

Environmental Parameters

I. ECOLOGY

(A) Species & Populations
- (1) Rare and endangered plant and animal species
- (2) Productive plant species
- (3) Game animals
- (4) Other animals
- (5) Resident & migratory birds
- (6) Sport Fisheries
- (7) Commercial fisheries
- (8) Pestilent plant and animal species
- (9) Parasites

(B) Habitats and Communities
- (10) Species diversity
- (11) Food chains
- (12) Land use for habitats and communities

(C) Ecosystems
- (13) Productivity rate
- (14) Hydrologic budget
- (15) Nutrient budget

II. ENVIRONMENTAL POLLUTION

(D) Water Pollution
- (16) Algal blooms
- (17) Dissolved oxygen
- (18) Evaporation
- (19) Fecal coliforms
- (20) Nutrients
- (21) Pesticides, herbicides, defoliants
- (22) pH
- (23) Physical river characteristics
- (24) Sediment load
- (25) Stream flow
- (26) Temperature
- (27) Total dissolved solids
- (28) Toxic substances
- (29) Turbidity

(E) Air Pollution
- (30) Carbon monoxide
- (31) Hydrocarbons
- (32) Particulate matter
- (33) Photochemical oxidants
- (34) Sulfur oxides

(F) Land Pollution
- (35) Land use and misuse
- (36) Soil erosion
- (37) Soil pollution

(G) Noise Pollution
- (38) Noise

III. ESTHETICS

- (H) Land
  - (39) Land forms
  - (40) Geologic surface material
- (I) Air
  - (41) Pleasantness of sounds
- (J) Water
  - (42) Surface characteristics
  - (43) Water-land interface characteristics
- (K) Biota
  - (44) Vegetation
  - (45) Fauna
- (L) Man-Made Objects
  - (46) Visual
  - (47) Condition
  - (48) Consonance with environment
- (M) Composition
  - (49) Interaction of land, air, water, and man-made objects
  - (50) Color

IV. HUMAN INTEREST

- (N) Educational-Scientific Significance
  - (51) Geological significance
  - (52) Ecological significance
  - (53) Archeological significance
  - (54) Unusual water phenomenon
- (O) Historical Significance
  - (55) Related to persons
  - (56) Related to events
  - (57) Related to religions and cultures
  - (58) Related to architecture and styles
  - (59) Related to the "western frontier"
- (P) Cultural Significance
  - (60) Related to Indians
  - (61) Related to religious groups
  - (62) Related to ethnic groups
- (Q) Mood-Atmosphere Significance
  - (63) Isolation-solitude
  - (64) Awe-inspiration
  - (65) "Oneness" with nature
  - (66) Mystery

The content of the EES is designed to be as consistent between each category and each component as is possible. However, it will be immediately recognized that there are significant differences in the types of parameters that one is able to designate in one category compared to those in another. There are three primary reasons for this diversity.

1. The tremendous diversity between category types.
2. The ability to quantify relationships and values in each category is different.
3. More is known on how to express quality in some categories than others–difference between objective and subjective evaluation.

IV. *QOL*: ECONOMIC AND SOCIAL PERSPECTIVES

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TOWARD BALANCED GROWTH: QUANTITY WITH QUALITY

A Summary of the Report to the President by the National Goals Research Staff

Report to the President by the National Goals Research Staff, Washington, D.C., 1970

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TOWARD BALANCED GROWTH: QUANTITY WITH QUALITY

Summary of the Report to the President by the National Goals Research Staff, July 18, 1970

President Nixon established the National Goals Research Staff July 13, 1969. The role assigned to the Staff was to analyze social trends, make projections about the kind of society that could result if present trends continue, forecast future developments and pose alternatives for the future domestic life of the nation. The Staff did not undertake to set goals or to be a planning office. Rather, it studied and compared a variety of national domestic strategies that are available to the nation and that can help in making the kind of informed choices essential to guide the processes of change.

The past year's work of the NGRS represented an experiment in supporting the formulation of national policies. One objective of the experiment was to aid in the improvement of the national decision-making processes of public and private institutions by anticipating events rather than by simply reacting to "crisis" situations. A second objective was to provide longer-range concepts of future conditions of our society in the recognition that the choices made today will importantly affect the kind of society we will have in 10, 20, or–in some cases–even 50 years. A third objective was to provide the American people with information which would facilitate their participation in setting the nation's goals and related policies.

In connection with this third objective, the President directed the Staff to prepare a public report by July 4th of this year. He stated that the report should "serve as a focus for the kind of lively widespread public discussion that deserves to go into decisions affecting our common future."

The report of the National Goals Research Staff takes its central theme from the President's call, in his State of the Union message, for the development of a policy on national growth. The report examines a number of areas of American life where the issues of the nature and direction of growth are being argued. But, increasingly, we have become aware that growth is not enough. We have become alarmed at the threats to our environment posed by industrial and technological progress. We have developed a new and acute awareness that the *quality of life* cannot be measured in quantitative terms.

Concern has bred alarm, and some have urgently demanded that we call a halt to growth altogether. Yet, as the report points out, our need is not to stop growth but to redirect it. We can have quantity with quality. In fact, given our rising levels of expectation, we cannot have quality without quantity. But it is equally true that quantity without quality is no longer adequate either as a goal or as a standard of measurement. Plainly, we need to develop a concept of "balanced growth" and the guidance mechanisms through which it can be achieved on a sustainable basis. Many of the policy debates of this coming decade will be over how we strike the balances.

Making intelligent policy choices becomes increasingly complex as society itself becomes more complex, and as the consequences of various courses of action become more far-reaching and more intricately intertwined.

Though the choices are more complex, our means of making those choices have also been greatly advanced.

The vast increase in scientific knowledge, in technological capability, in our understanding of the economic and social forces that shape our society, all greatly increase both our capacity and responsibility to make intelligent choices about our future.

Of all the advances in our understanding of the ways in which human institutions work, none is more significant than those we now are making in our understanding of the means by which results that we want can be achieved and those we do not want can be avoided.

The report emphasizes that as we choose our goals for 1976 and beyond, it is vital that the process of decision be as broadly based as possible—not only involving the intelligence and the energy of people everywhere, but also inspiring an active sense of participation—"a role for everyone."

This report is meant to inspire debate—and to help give that debate form, direction, and meaning.

If people are to make their wishes felt effectively, it is important that they be aware of what the real issues are—that is, what the real questions turn on, where the "pressure points" are, and what the considerations are that must be weighed in any responsible determination of a particular policy. By presenting some of the emerging major debates in this form, it is the objective of the report that informed, effective, and constructive discussion of the issues involved will be encouraged on the broadest possible basis.

A summary of each of the chapters of the report follows.

CHAPTER 1 –EMERGING DEBATES

America appears to be at a point of profound change, frequently characterized as that from an industrial society to a "post industrial society"—from a society in which production of goods was of primary concern to one dominated more by services and the generation and use of new knowledge. Consequently, we are in a period of marked social change, one aspect of which is the search for a growth policy to guide that change. This report examines several areas in which the choice of a future growth policy is explicitly and implicitly being debated. Its intent is to use these case examples as a part of a learning experience, as one discrete step in the evolution of a policy of balanced growth, as called for by the President. The approach is analytical and not prescriptive. The purpose is to aid the American people and their representatives in what is assumed to be a long process for evolving a growth policy.

The key substantive areas in which the problem of growth is being debated are: population growth and distribution, environment, education, basic natural science, technology assessment, and consumerism. In general, these topical areas do not correspond to the major social problems with which we are presently concerned, including those of our cities, campus unrest, the Vietnam War, and race relations. These represent dissatisfactions over our performance according to our established priorities.

Probably the major message that comes from the existing debates over a growth policy is not that our institutions have proven incapable of doing their job. Rather, many of our institutions have performed very well the tasks which we set for them a few decades ago. However, in so doing, they have created unanticipated problems with which we must now deal, and they must be reoriented toward the tasks that are appropriate in a society capable of a new level of performance. The range of criteria whereby we will judge institutional performance will be broader in scope and longer in time perspective. An essential part of this period of transition is the attempt to shift from a reactive form of public decision making, in which we respond to problems when they are forced upon us, to an anticipatory form in which we try either to avoid them or be prepared to deal with them as they emerge.

It is the hallmark of our country that Americans have adjusted to change while preserving the basic qualities of their institutions. This has happened a considerable number of times in our history. In the course of this history, a predominant theme has been one of economic growth, and an accommodation to a larger population. At no time was economic growth considered so dominant a goal that it obscured all other concerns, but neither was the growth per se viewed as other than a good thing.

Today, for the first time, we find the virtues of economic growth questioned, and this issue is put in popular terminology as one of "quantity versus quality." This is, in the view of this report, a false phrasing of the issue, since the new qualitative goals being proposed and the old goals yet unmet can be achieved only if we have continued economic growth. The issue is better put as one of how we can ensure continued economic growth while directing our resources more deliberately to filling our new values.

A large portion of the explanation for this seems to lie in our demonstrated ability to achieve economic stability and growth in the period following the passage of the Employment Act of 1946. Even though our economy is at the moment in a period of transition, the pervading public and official view is that we are a nation of growing, unprecedented economic resources.

At the same time that we have become a nation that can afford to care we have also become a nation that cannot afford not to care. The past decade has been marked by an emerging sense of conscience for the plight of the underprivileged, an awareness of social and economic problems that are the unanticipated consequence of our past actions, a resolution that we can guide our affairs more rationally, and simultaneously, a broad popular demand for citizen participation in the management of their own fate. While this was happening, we also developed new techniques of decision making whose promise spurred the resolution to run things more rationally, but whose full potential is incompletely understood or tested.

While this resolution to run our affairs both more rationally and more effectively was emerging, two complicating circumstances arose. The Vietnam War placed a strain on our admitted large resources and belatedly forced us to recognize the necessity of considering priorities more seriously. And, a more complex model of how to go about purposive action evolved in part from the ecologists' experience with the environment, and in part from our increasing knowledge of social science and our mixed experience in attempting social and political reform.

We thus find ourselves at a point at which the following things are true: We have rising expectations and changing values concerning the goals we should set for ourselves both in resolving existing inequities and in improving the quality of our lives. However, while our resources are large and growing, they are finite and we must set priorities more deliberately. In compensation for this complication we have the promise of more rational methods of public decision making as a way of selecting and implementing our priority goals. But, this must be brought about in a context in which there is greater public participation, and greater recognition of the complexities of the world—both social and environmental—in which we live.

CHAPTER 2–POPULATION GROWTH AND DISTRIBUTION

In a nation that once valued its population size and growth, and in which the phrase "fastest growing" was attached to the name of proud municipalities, the question of overall population size and distribution has come under active debate.

The question of population size in the United States is not Malthusian. The issue is not whether we can feed and clothe a population of any size we can realistically envisage, or even supply it with the expanding amount of energy it may demand. It is rather that of whether a technologically advanced and industrially prosperous nation wants, or can continue to pay the price of congestion and contamination that comes from our overall affluence. It is suggested that our size may be limited by the ability of the environment to absorb the wastes that result from our economic success.

Students of the overall size of our population are in no agreement as to precisely what the size will be by the year 2000 nor on what optimum population size for a nation such as ours would be. But, more recent projections suggest that the increase in our population over the next 30 years may be considerably less than the additional 100 million that had generally been forecasted. In fact, it may even be that the present rate of increase will slacken off so that we will reach the zero growth rate that some demographers have been advocating.

However, the issue of population distribution is a different matter, and one to be taken seriously regardless of what may be the upper limit of the population size. Our population has been concentrating increasingly, not only in cities, but more and more proportionately into a few rather large urban masses. This has resulted in a lowering of the *quality of life* in both urban and rural areas. Projection of such a migration pattern is actually a de facto distribution policy since it will affect such decisions as industrial plant location and other types of investment which will make the prophecy of increasing concentration self-fulfilling.

We have before us a set of decisions. One which appears not to be urgent is that of overall size of the population—even after the effects of a considerable amount of immigration are taken into account. Apropos of population distribution, we need to decide on whether or not we will adopt a deliberate strategy to encourage internal migration to negate the forecasts of ever-growing urban congestion in a few megalopolis. A viable option for such an alternate strategy is a policy of encouraging growth in alternate growth centers away from the large urban masses, coupled with a complementary effort of the use of new towns.

CHAPTER 3–ENVIRONMENT

Man is redefining his relationship to his environment. He has progressed from fearing, to understanding, to using, to abusing, and now to worrying about the physical and biological world about him. Throughout all but the very recent history of the United States, our relationship to the environment has been one of exploitation. We have seen our natural endowment as a source of riches to be extracted and used, or later, to be extracted and processed. Concern for the environment was generally limited to whether or not we were exhausting our inheritance of sources of food, energy, and materials.

The current interest in the environment has two distinctively novel emphases. The first is that the limitations that the environment places on our activities may not be on the input side (sources of food, energy, and materials), but on the output side (a place to dispose of our wastes). The second, which is closely related to the first, is that the environment, in addition to having a limited capacity to absorb wastes, is a complex ecological system in which intervention of an apparently minor sort can, and often does, have far-reaching consequences through a chain of unsuspected reactions.

Both of these aspects of thinking about the environment have important consequences on the way we think about other things. They raise the question of whether or not there may be an upper limit on our economic growth as a consequence of the limitations on how much waste can be absorbed. And, the model of complex ecological systems affects our whole way of thinking about the consequences of our action not only in the environmental sphere, but also in the social sphere where we are coming to realize that causation is just as complex.

Some scientists and other anxious citizens assume a doomsday model of the future in which increased economic production will drive us to our destruction. In response, others propose what is called a paradise–regained model which would return us almost to a state of nature. Fortunately, the doomsday model does not forecast that which is inevitable, and the latter, which would probably be unattainable if tolerable, need not be entertained.

A mixed strategy of response to our environmental problems is proposed. We need to expand our inadequate knowledge of ecological systems. But while expanding this knowledge, we must take those measures which we know are called for. We need to consider our current technological and economic alternatives in the light of long-range ecological balance. Additionally, we need to resolve conflicts between our demands for products and services, and the depletion and pollution generated by them.

The market mechanism can and should be used as one of the devices for regulating these demands. Government should play a role through appropriate regulations, taxes, subsidies, and standard setting. Since environmental problems and their solutions are of a global nature, we must and are beginning to act in concert with the other nations of the world.

Our environmental problems are a result of our technological and economic successes and of our philosophical view of nature. Now we must learn to use our technology and our economic output better to bring us in harmonious relationship to that environment. As will be found in other sections of this report, it is becoming apparent that the relatively narrow criteria by which we have, in the past, judged technical and economic progress must be expanded to consider a wider range of consequences.

CHAPTER 4–EDUCATION

We have an educational system that is in many respects unparalleled. It has grown in size and resources to the point where we have nearly universal education through the secondary schools and a proportion of our population attending institutions of higher education that is unprecedented. Yet, this system is under severe attack and criticism; it is seen as having been set up to serve the needs of an America that has greatly changed in the intervening years. There are many who argue that it is necessary for the schools to deemphasize quantitative expansion along traditional lines and emphasize adaptation to the needs of a rapidly changing society.

In the past, the public has equated going to school with education. The role of the school was to transmit information and instill traditional values. The society of today is one changing so rapidly that skills and information become outmoded, and traditional values are under challenge. Furthermore, the proportion of information that children receive from the mass media is so large and the range of values to which they are exposed so diverse that it may well be that the schools should be devoted to giving them the cognitive skills for integrating information, and a framework within which to sort out the diverse values to which they are exposed.

In addition to what may fundamentally be a new orientation demanded of the schools, they are being asked to respond to current problems in two ways. First, it is said that they should be relevant to the needs of the student, which is to say that they should teach him as an individual to be able to deal with contemporary problems. Second, the higher institutions of learning, in particular, are being asked to solve the present problems of society.

The choices with which the schools are confronted involved, on the one hand, teaching problem-solving skills, fostering the development of students as individuals, and conducting problem-oriented research. Or, on the other hand, there is the option of continuing to transmit the old knowledge and values at the primary and secondary levels, and continuing to transmit the traditional knowledge and seeking to develop knowledge for its own sake at the higher levels of education.

By and large, it would seem that we must look for some appropriate mix rather than shift over to a complete doctrine of relevance. In the meantime, we need to develop further understanding of the educational process and of how to evaluate it. We must further develop an experimental posture toward innovation in education which will reflect our basic uncertainty as to how to go about the many problems with which the educational system is faced.

All of the above holds for the educational system at large. With respect to the children of minority groups, we have the special task of ensuring equal educational opportunity, and of understanding and dealing with those special disadvantages which are imposed on them by their environment.

Taken all in all, the educational system, which is the crucial single institution for the development of our citizenry so that they can live happily, shape our system, wisely, and contribute to both the direction and rate of its growth, is in a state of severe stress. The educational system is having its own "growth" problems which, if not solved, will have a profound impact on the growth of the Nation as a whole.

CHAPTER 5–BASIC NATURAL SCIENCE

The American scientific establishment has grown and the capacities of its researchers have developed to the point that our capability in basic research has made us preeminent in the world. Having achieved that position, basic natural science finds itself in a crisis of both financial and social support. Historically, Federal funding, the main source of basic scientific research, has been large relative to the scientific resources available to do the work. In the recent past, as the scientific establishment continued to grow, the supply of funds leveled off so that the previous relationship has in effect been reversed. There is too little money relative to the number of scientists involved. At the same time, in the past half decade, scientists and their works began to come under fire as a result of the association of scientists with the military, and with industrial technology which has produced environmental pollution. In concert with these two developments, our national priorities have shifted to the solution of social problems, and basic scientists are being asked to shift their focus of work from the development of knowledge for its own sake to working on basic problems which have relevance for today's social issues.

The result is serious strain on an institution which furnishes us with our most fundamental understanding of ourselves and of our world, and which has been the source from which technology has evolved in recent times to serve economic growth. In the past few decades, we have been very successful in making basic science useful, but now we find ourselves in a crisis as to how to ensure its future usefulness, and of how to balance the long-range utility of basic knowledge with present urgent needs.

One of the major decisions with which we are faced is that of the level of support we will furnish basic science in the future. This is clouded by the problem of making basic research "useful" in the short run. It is in the nature of basic research that answers to practical problems may be found in unsuspected areas of inquiry. Some problem areas, at a given time, have a greater potential for exploitation than others. Setting research priorities on the grounds of probable utility is often a choice of possible short-term benefits against the longer-term ones which might result from a more rapid expansion of the basic pool of knowledge by permitting science to pursue the internal logic of its own development.

What is needed, and may in fact be developing, is a forum in which the partially conflicting needs for maintaining the integrity of the core of basic research and the practical needs of the society are resolved.

In conjunction with the need to work out an appropriate level and distribution of funding, we must face the fact that an articulate minority are attacking the very rationale and spirit of science and of rational inquiry itself–the most elementary tools man has for the orderly guidance of his affairs.

CHAPTER 6–TECHNOLOGY ASSESSMENT

The nation's infatuation with technology is at a turning point as profound as that of its relationship to the environment. Historically, we have tended to do that which was technically possible, if it were economically advantageous, on the simple ground that this represented "progress." However, as technology has increased with great rapidity, it has forced on us increasing unplanned social change and environmental problems we did not anticipate and do not want. At the same time, our notions of the complexity of social and environmental problems have made us increasingly cautious with respect to the actions we plan to take. Our level of affluence has given us a longer time perspective within which to assess the consequences of our actions. As with so many other of the debates with which we have been concerned, the technology assessment movement–which embodies this new attitude toward technology–asks us to judge our actions by a wider range of criteria than we have used in the past.

Formally, technology assessment is a term coined in the Congress to label a set of procedures to aid the Congress in making decisions for the orderly introduction of new technology and the evaluation of technology already in use. However, it is better viewed as a manifestation of a larger phenomenon of a decreasing willingness of both the public and its representatives to tolerate the undesirable side effects of things done in the name of progress. The public has protested effectively against the displacement of people by highways, aircraft noise, and the building of new power plants. Specific actions have indicated that we have the disposition to forego immediate economic benefits in order to avoid social and environmental costs which once would have been accepted with no more than pro forma consideration. The existence of formal technology assessment, now in both the congressional and executive branches, is to be taken as no more than a specific manifestation of the broader concern.

There are major policy problems with the prospect of doing technology assessment in a formal fashion. One is that of establishing criteria for deciding which among all of the new technologies emerging shall be selected for assessment, and how inspections, standards, and controls shall be established. Another is the extent to which technology assessment shall become a "way of life" in the American economy with increased consideration of the second-order consequences of technology through all strata of decision making, both private and public. Most general, however, is the problem of how we will manage the impact of the possibility of technology's adverse effects with the demand for new technology to ensure economic development. Among other things, we may have to accelerate our efforts to detect new benign technology opportunities and facilitate their rapid introduction to offset the impact of inhibiting the introduction and use of harmful technology.

CHAPTER 7–CONSUMERISM

American business prides itself in its ability to develop, produce, and deliver a great flow of new technologically sophisticated products of a wide variety. Yet, its very success in this has produced a wave of complaints. There have been consumer movements in the past based on issues of product safety and quality, deceptive practices, monopolistic practices, aesthetics, and so on. However, what marks the new consumer movement as distinctive is that it features resentment that the stream of new products is so large and the differences among products so small that choice among them is said to have been made difficult. Furthermore, it is argued that the technical complexity of many of them is such that the untrained individual cannot evaluate them.

The result has been the evolution of a system of consumer protection which, since 1964, has featured commissions and special assistants at the highest levels of Government, increased activity in the regulatory agencies, and finally in 1969, a Presidential enunciation of a "Buyer's Bill of Rights." Laws have been passed and new standards set. Testing procedures have been tightened. Consumer information services have grown.

The anomaly of the present consumerism market is that a highly market-oriented economy has produced a situation, in which it is said by at least an influential minority, that the doctrine of consumer sovereignty–the notion that the consumer can regulate business by his free choices–is no longer tenable for some undefinable but sizable segment of the marketplace. Some extreme manifestations of this position would have a considerable impact on the way our economy runs. Already, the consumerism movement has had an important and probably beneficial influence on business practice. This movement consists of a myriad of small issues, but the large one confronting us is that of developing a proper policy posture that will give the desirable amount and kind of protection to the consumer and, at the same time, preserve a business environment in which the economy can continue to grow.

The consumerism movement has been regarded by some as a fad. It is important to note that the complaints which stimulate the present consumer concerns are an integral part of technologically sophisticated, market-oriented economy such as we have so deliberately developed in recent decades and which seems certain to continue.

CHAPTER 8–ECONOMIC CHOICE AND BALANCED GROWTH

The search for a policy of balanced growth has major implications for the allocation of economic resources and is crucially dependent upon economic growth. Conventional economic policy goals include full employment, an acceptable rate of growth, price stability, and a satisfactory balance of payments. Added to these now is a new set of goals under the vaguely defined label of "*quality of life.*" These concerns mirror a desire by many Americans to create a society better able to enjoy what it produces, and to grow in ways harmonious with its physical environment.

The setting of new goals and the establishment of priorities among them are matters of social choice. Economic analysis can help in understanding some of the central aspects of these choices, but it cannot dictate the answers. The choices themselves are those of the people, expressed individually through their private institutions and through their governments. The key choices are among competing ends. Economic analysis can contribute toward the meeting of these ends once they are chosen, and an economic policy of sustained growth can make it possible for more of these ends to be achieved.

CHAPTER 9–TOWARD BALANCED GROWTH

This report is motivated by the President's explicit call for the development of a national growth policy. It is assumed that both the meaning and form of this policy will evolve and that contributions such as this are but steps in that direction. This report takes an inductive approach to the overall problem by identifying a number of issue areas in which it seems meaningful to say that a debate bearing on growth policy is taking place. The issues which were selected are those which the National Goals Research Staff judged would make a distinctive contribution to the Nation's awareness. An example of an exclusion might be that of urban problems, a subject truly essential to our growth, but a matter much discussed by others of greater competence on that topic.

The major lesson to be extracted from the substantive problems reviewed here is the high desirability of an explicit growth policy with a relatively long-term perspective. In instance after instance, it was found that today's problems are a result of successes as defined in yesterday's terms. The object lesson has not been that our institutions are incapable, but that in the past we set performance criteria for them in terms now recognized as too narrow but which at one time were appropriate. We have become widely aware of the second-order consequences of our action, and we have demonstrated our resolution to take them into account when we can anticipate them. What we need is increased ability to anticipate those consequences and an explicit policy framework within which to evaluate them.

The central ingredient in the development of a growth policy will be for the American people to decide just what sort of country they want this to be. This process is in being, as reflected in these debates. Hopefully, this report and other events will serve as vehicles to facilitate discussion and choice. To further facilitate this process, we will have to develop better institutional arrangements for the people to relate to the leadership and better mechanisms of policy analysis to serve all parties.

While it is clear that an explicit growth policy is desirable, it seems equally clear from these debates that it is likely that what will emerge is not a single policy but a package of policies consistent with each other, each designed to meet one or more of our national objectives. This package of policies will shape both the directions of our society and the balance among the many segments of society in terms of priorities and interrelationships. It will not be a set of policies which the government alone can develop and effect. It will be a set of policies which emerge from the decisions of the government and the people, and which, in turn, will affect the decisions of both the government and the people.

These are only a few examples of possible developments, many of which have begun or may begin to emerge in the 1970's. Many of these developments may not appear in the 1970's or even later, but the list suggests that, as we view the prospects for our nation, we must broaden our vision to take into account a variety of developments which will bring many new dimensions to human experience.

As illustrated by these selected trends and forecasts, the 1970's promise to be a decade of extraordinary change. Our nation in 1980 could be one in which cities are more clogged with immovable traffic, air is less breathable, streams polluted to the point where expensive processes will be necessary to get usable water, seashores deteriorating more rapidly, and our people suffering needlessly from having not developed the necessary institutional arrangements for achieving the promise of this decade of change.

On the other hand, America in 1980 can be a nation which will have begun to restore its environment, to have more balanced distribution of regional economic development and of population; a nation which has abolished hunger and many forms of social inequality and deprivation; and a nation which will have begun to develop the new social institutions and instruments necessary to turn the promises of this decade of change into reality.

If we are to see the second of these possible futures realized in the America of 1980, we must begin now to define what we wish to have as our national goals, and to develop in both our public and private institutions the specific policies and programs which will move us toward these goals.

WELFARE MEASUREMENT AND THE GNP

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WELFARE MEASUREMENT AND THE GNP

Edward F. Denison

It would be enormously convenient to have a single, generally accepted index of the economic and social welfare of the people of the United States. A glance at it would tell us how much better or worse off we had become each year and each decade. We could judge the desirability of any proposed action by asking whether it would raise or lower this index.

Some recent discussion seems almost to imply that such an index could be constructed. Articles in the popular press even criticize GNP because it is not such a complete index of welfare, on the one hand ignoring the fact that it was never intended to be such an index, and on the other, suggesting that with appropriate changes it could be converted to one.

COMPONENTS OF A WELFARE MEASURE

A single, generally acceptable index of welfare cannot be constructed. This ought to be obvious, but it may be instructive to state some of the changes in society such a measure would have to encompass and the problems its compilers would face.

OUTPUT

The output available to satisfy our wants and needs is one important determinant of welfare. Whatever want, need, or social problem engages our attention, we ordinarily can more easily find resources to deal with it when output is large and growing than when it is not. GNP measures output fairly well. Net national product (NNP) measures it even better, provided that depreciation is calculated in a consistent and reasonable way. The capital stock study of the Office of Business Economics provides data that can be used to calculate NNP.

A myriad of different products must somehow be combined if one is to obtain a measure of total output. We can obtain a generally acceptable measure only because market prices provide weights to combine them that are widely accepted as reasonable and objective. The rationale is that, given the relative prices they face, people individually or collectively are free to spend their money in whatever way maximizes their satisfactions. If they preferred to do so, they could shift purchases from one product to another, substituting at the ratio of market prices.[1] If automobiles cost $3,000 and TV's $300, they could choose to buy another car and 10 fewer TV's, or the reverse.

GNP and NNP valued at constant prices permit measurement of changes in the quantity of output with products combined by use of prices in the base year (at present 1958). They are extremely useful measures. But users should understand their characteristics. Two of these seem to me to be the most important in qualifying their use in welfare measurement.

First, households, governments, and nonprofit organizations are regarded as the final users of the economy's output, and GNP and NNP measure the goods and services they buy.[2] How effectively they use their purchases is outside the purview of GNP or NNP. Soap, vacuum cleaners, washing machines, and the time of domestic servants bought by the housewife are measured, not how clean her house and linen may be. Similarly, the teachers' services, books, school buildings, etc., purchased by school systems are measured, as are the planes, ammunition, and soldiers' services bought by the Department of Defense; NNP does not tell how much education and national security are obtained per dollar (in 1958 prices) of expenditure for such items.

It is sometimes suggested that governments (and nonprofit organizations) should be treated as if they were businesses "selling" services to individuals. NNP in constant prices would include the services provided (measured in constant prices) instead of government purchases. Because most government purchases are for education and defense, this proposal requires ways to measure changes in the amounts of education and defense that are independent of government expenditures. But how? Educators and generals have found no acceptable procedure to make such an estimate, and until they do, it would be a bit absurd to expect the national accountant to do so. Present estimates of real GNP truly measure the services provided by governments only if the services provided per dollar of government purchases (in 1958 prices) are the same each year as in 1958.

The prospect for measuring the services a household secures from its purchases (when they are combined with the "labor" of household members, which is omitted from national product) as distinct from the value of its purchases seems at least equally remote.

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[1] In an economy with indirect taxes and subsidies, there is a complication which leads national accountants to construct two measures of national product. One, recommended for "welfare" questions, uses market prices as weights; the other, recommended for resource allocation problems and productivity measurement, uses factor cost values instead. For most questions and comparisons the choice can be made.

[2] I ignore here the net capital formation and net export components of NNP.

The second characteristic concerns the "quality change problem." When expenditure for a new or improved product appears, it is counted as output equal to the quantity of previously existing products that could have been bought for the same expenditure (based on 1958 price ratios if the new product had appeared by then, otherwise on price ratios when it first entered price indexes).

Real NNP in 1950 was half that of 1968. This means that output in 1950 was half as big as the sum of (1) the quantity of products produced in 1968 that were the same as those produced in 1950 and (2) the quantity of 1950 products that could have been produced in 1968 by the resources that were actually used in 1968 to produce products that did not exist in 1950.

The change in real NNP understates the change in the ability of output to satisfy our wants because it ascribes no value to the increased range of products the economy is able to provide; for example, in 1968 medicines were available that did not exist at all in 1950. I am personally convinced that there is no way to measure this understatement; not all economists agree.

Such characteristics, which in my view are not remediable, limit the accuracy of real product as a measure of changes over time in the ability of output to satisfy our wants.[3] Nevertheless, real product is a very useful measure. But to evaluate welfare we would need additonal measures which would be far more difficult to construct.

REAL COSTS OF PRODUCTION

We would need an index of real costs incurred in production, because we are better off if we get the same output at less cost. The starting point for an index of labor costs exists in series for total man-hours worked, and we can also compute hours per capita or per worker. But use of man-hours for welfare evaluation would imply unreasonably that to increase total hours by raising the hours of eight women from 60 to 65 a week (coverage of the Maryland 60-hour law recently was reduced greatly) imposes no more burden than raising the hours of eight men from 40 to 45, or even than hiring one involuntarily unemployed man for 40 hours a week. A usable measure of the real costs of working would consider that the welfare benefits from working fewer hours decline as hours are shortened and may even disappear.[4]

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[3] The two characteristics I have described result from changes over time in the kinds of end products that the state of knowledge permits the economy to provide, and in the skill of individuals and governments in utilizing their purchases to meet their objectives. They do not limit the significance of comparisons of alternative conditions or policies unless these alternatives would affect such knowledge or skill.

A measure of real costs of labor would also have to consider working conditions. Most of us spend almost half our waking hours on the job and our welfare is vitally affected by the circumstances in which we pass those hours. From the beginning, labor unions have concerned themselves with "wages, hours, and working conditions." Only the first of these related to the goods and services the worker can buy; the others relate to real costs. Perhaps it is under this heading, too, that the deaths and injuries from wartime service in the armed forces, and the disutility of involuntary service in the armed forces in war or peace, should be counted.

We have data on saving, but no measure of the real costs of what was once called "abstinence." And we have no acceptable way to combine the real costs of labor and abstinence.

NEEDS

To measure welfare we would need a measure of changes in the needs that our output must satisfy. One aspect, population change, is now handled, crudely, by converting output to a per capita basis on the assumption that, other things equal, twice as many people need twice as many goods and services to be equally well off.[5] Beyond this, an index of needs would account for differences in the requirements for living as the population becomes more urbanized or suburbanized; for the effect of weather changes on requirements occasioned by epidemics or new diseases; and, most of all, for changes in national defense requirements. Such an index would have to tell us the difference between the cost of meeting our needs, to the extent that we do, in a base year, and the cost of meeting them equally well under the circumstances prevailing in every other year.

It is sometimes wrongly supposed that the necessity of taking account of some changes in needs can be obviated by omission from NNP of expenditures for purposes for which needs change: for example, by elimination of expenditures for local transportation, heat and air conditioning, health, or defense. This procedure fails utterly. It yields the false result that we are equally well off whether, in the same circumstances, we ride or must walk to work, freeze or are comfortable, do or do not obtain medical care when we are sick, or provide or do not provide for national security. Needs and provision to meet them must be separately evaluated.

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[4] In this formulation I regard the real costs of working additional hours as including the loss of welfare resulting from less leisure time. If it is necessary to treat the two as separate items affecting welfare, the problem is still more complicated.

[5] In my view, this is a tolerable assumption only if no change occurs in the composition of the population by age and family status. In the first place, requirements for individuals vary with age and marital status. Second, an intractable problem is created by the simple fact that a couple with two wanted children is not worse off than if it had no children and the family had twice the per capita income. Since the couple rejected that option they must be better off. Also, greater ability to control family size has surely improved welfare in a way that cannot be captured in any measure I know.

THE ENVIRONMENT

Measures of "needs" shade into measures of the human and physical environment in which we live; perhaps it is here that the concept of economic welfare broadens to encompass "social welfare." We are all enormously affected by the people around us. Can we go where we like without fear of attack? Can we attend a lecture without its being disrupted? Will we be discriminated against? Are our neighbors congenial? We are also affected by the physical environment–purity of air and water, accessibility of park land, presence of trash or rats in our alleys, and all the other conditions receiving so much attention just now.

To measure the state of affairs with respect to any aspect of the human and physical environment requires adequate and accurate data. Such data are generally deficient in both quantity and quality, and collection and evaluation urgently need expansion. But, given data, construction of an index of the goodness or badness of almost any environmental aspect faces at least two serious problems.

First, relations between environmental conditions and welfare are rarely linear, and nonlinear relationships are hard to establish. A little air pollution is harmless, more an annoyance, a great deal lethal. Discrimination against Jews by a random 10 percent of employers, landlords, and operators of public places might be merely an annoyance to those affected; by 40 percent, a real hardship; by 90 percent, an economic and social catastrophe. The last situation is far more than nine times as undesirable as the first.

Second, if anything except the most detailed imaginable set of data is contemplated, weighting is required: To combine robberies and murders in a crime index; to combine pollution of the Potomac and pollution of Lake Erie in a water pollution index; to combine trash in Northeast Washington alleys and its absences on Route 70-S into a trash index. An expert in a field may be able to provide judgments with respect to the problems of nonlinearity and weights that would permit an interesting index to be calculated. However, the necessity for numerous individual judgments that are difficult to assess or even to describe must impair general acceptability of measures based upon them.

The absence of any natural weighting scheme is an even greater obstacle combining indexes of crime, water pollution, racial discrimination, and the like into a single index. Personally, I see no basis at all for combining indexes of different aspects of the environment into a combined index that will command general acceptance. I can imagine only letting each individual in the country compute his own index with his own personal weights, and then averaging them. But even this procedure is almost sure to be biased because we are all concerned with the aspects of the environment that currently are problems. Who would now think to consider the dangers of attack by hostile Indians? Or the risk of being doused by slops thrown from windows as he walks the city streets? Even the very recent elimination of refrigerator doors that cannot be opened from within, and cost the lives of so many children, is almost forgotten. The annual series for "Persons Lynched" appeared in the Census Bureau's Historical Statistics but not in its current Statistical Abstract.

THE DISTRIBUTION OF INCOME

To measure welfare we would need an index of the "goodness" of the size distribution of income. There is probably a consensus that, given the same total income and output, a distribution with fewer families in poverty would be better than the present distribution, and possibly that less inequality throughout the distribution would be an improvement. There is no agreement on an ideal distribution, from which departures could be measured.

OTHER ASPECTS

The list I have presented is not exhaustive. I have ignored the hard fact that tastes differ among individuals and change over time. I have not yet recalled that welfare is affected by people's perception of reality as well as the objective facts; one's fear of crime on the streets need not be closely related to actual risks. The authors of "Toward a Social Report"[6] stressed the need for attitudinal data to develop welfare measures. I have not provided room for any of the pleasures and worries that are related to purely personal relationships and that for most people dominate all else in affecting their feeling of well-being.

IMPRACTICABILITY OF A GENERAL MEASURE OF WELFARE

Even if we could construct indexes of output, real costs, needs, the state of the environment, income distribution, and other relevant aspects of life, we could not compute a welfare index because we have no system of weights to combine them. Certainly statisticians and social scientists are in no position to assign weights.

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[6] U.S. Department of Health, Education, and Welfare, "Toward a Social Report" (January 1969).

The point to be stressed is that the situation is just the same as in making policy decisions in government, in business, in the family, or anywhere else. Most decisions that might be made have favorable and unfavorable effects on various aspects of life. Decision makers must try to determine the favorable and unfavorable effects of alternatives and then decide on their course of action. Economists, statisticians, and other social scientists can help determine what the effects are likely to be. But the responsible decision maker must decide how the favorable and unfavorable effects balance out, and different persons will decide differently. This is only another way of saying that a generally accepted weighting system does not exist.

COSTS OF GROWTH AND THE NATIONAL PRODUCT

It is fashionable to describe our environmental problems as costs of economic growth, and even to suggest that these costs should be deducted from GNP and NNP. I have no idea whether this would raise or lower the growth rate in any particular period. But a few observations are in order.

First, some of the objections to "growth" are to an increase in population (or its geographic concentration) and the resulting congestion. Over the last two centuries, it is true, increases in productivity have permitted population to increase and led to its doing so. But this relationship is increasingly uncertain; births, which are the chief population determinant in this country, do not now follow changes in per capita income in any predictable way. It is no longer possible to regard the increase in population, and whatever disadvantages it may bring, as the consequence of an increase in output; there is no presumption that less output would mean fewer people. Moreover, there is no unanimity as to whether population growth or the steps that would be required to curtail it are undesirable or desirable. Population increase has meant less space per person and has affected other aspects of life adversely in the view of many people. Others stress the pleasures derived from children; almost none would like a higher death rate; and immigration, which has contributed importantly even to recent population growth, has presumably meant a better life for the immigrants.

Second, many aspects of the environment are only remotely, if at all, connected with the amount of production or income; and when they are, it is by no means obvious that high income worsens rather than improves the environment. Would such problems of the human environment as crime, drugs, student unrest, racial tension, and labor-mangement conflicts now be absent or even smaller if output and income had increased less than they did in the past decade or two? It seems unlikely.

I now turn to what clearly are environmental costs associated with production. Air and water pollution, the volume of solid waste, and other undesirable aspects of the physical environment have been increased by economic growth or, more accurately, by the increase in the production and use of particular products which have been produced and used in particular ways. Given an index of the state of the environment, a complete welfare evaluation would not require knowledge of the extent to which changes in this index were the result of production. Nevertheless, the idea of measuring the net gain from production by balancing the value of the deterioration of the physical environment caused by production against the value of greater output is attractive. The value of this deterioration could then be deducted from NNP to obtain what many would regard as a better measure of net output. But implementation of this suggestion would require an objective measurement of the value of the deterioration expressed as a dollar amount. Such a valuation does not exist, and its estimation would encounter all the problems involved in measuring the goodness of the environment plus those of deciding what portion of changes in its goodness were due to production.

At this point, let me emphasize that expenditures actually incurred to preserve or improve the environment are not at all the same thing as the value of the deterioration of the environment that is caused by production. Such expenditures must not be deducted in lieu of the value of the deterioration caused by production. To do this would mean that the more we diverted our resources and output from other uses to improvement of the enviroment, the smaller would be GNP and NNP. This surely is not a desirable result.

Fortunately, GNP and NNP are not reduced by diversion of resources from other uses to environmental improvement when the costs are borne by government or by consumers because expenditures by these groups are counted as final products. (This generalization includes such cases as the addition of antipollution devices to automobiles because in the national accounts the addition is regarded as increasing the quantity, rather than the price, of cars.)[7]

GNP and NNP can be regarded as providing defective measures of changes in output when expenditures to protect the environment are incurred by business in the form of current costs. Such purchases are not themselves counted as final products and they absorb resources that would otherwise be used to produce products that are counted as final. Steps already taken, and adoption of additional proposals, to increase expenditures for environmental control of this type will have the effect of reducing real output and productivity, as measured, below the values they would take if resources were not so diverted. Business expenditures for the safety of employees, which are also likely to rise as a result of new legislation, will have the same effect. The reduction in measured output could be avoided only by isolating business expenditures for these purposes and adding them to national product as final product. Such a solution is not, I fear, feasible because such a classification of business expenditures would encounter distinctions that are gradual and blurred. What we would need to know is the amount by which business unit costs exceed the theoretical minimum that could be achieved if production were to be conducted with no regard at all to the external environment or to employee welfare–implying no laws, no community pressure, and no conscience. Such a situation has never prevailed and is difficult even to imagine. What perhaps can be done, and should surely be attempted, is to start now to collect information on changes in expenditures for environmental and employee protection that will occur in the future. Even if such information does not lead or enable us to change the measure of output, it will enable us to interpret better the changes in output and productivity that we observe in the future as well as to know the true costs of the new programs.

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[7] Neither are GNP and NNP reduced, in the first instance, when business makes capital outlays for this purpose. But in the case of business capital outlay NNP is eventually reduced by a rise in depreciation, just as it is in the case to which I turn next.

IMPLICATIONS FOR STATISTICS

We need, can obtain, and should obtain additional information, including statistics, on many aspects of American life that affect welfare. We can and should explore ways of presenting and analyzing such information in a comprehensible form. Some of this research could well be performed by individuals familiar with estimation of the national accounts, because some of the statistical and conceptual problems are similar. However, we cannot obtain a comprehensive index of welfare.

There are likely to be pressures to make ad hoc changes in the existing national product measures that, it is supposed, will move the national product series closer to a complete welfare measure in one way or another. Such suggestions should be welcomed if they improve the measurement of the nation's output. I would myself urge regular publication of series for NNP and national income, as well as GNP, in constant prices. But some suggestions to change the measurement of national product will derive from confusion between an output measure and a comprehensive welfare measure. Such proposals must be rejected. GNP and NNP cannot be transformed into a comprehensive welfare measure. Efforts to do so can only impair their usefulness for the very important purposes of both long-term and short-term analysis that they now serve well.

TOWARD A SOCIAL REPORT:
INTRODUCTION AND SUMMARY

U.S. Department of Health, Education,
and Welfare

Toward a Social Report, U.S. Department of Health, Education, and Welfare, Washington, D.C.: U.S. Government Printing Office, January 1969, pp. xi-xxii.

TOWARD A SOCIAL REPORT: INTRODUCTION AND SUMMARY

U.S. Department of Health, Education, and Welfare

The nation has no comprehensive set of statistics reflecting social progress or retrogression. There is no government procedure for periodic stocktaking of the social health of the nation. The government makes no social report.

We do have an Economic Report, required by statute, in which the President and his Council of Economic Advisors report to the nation on its economic health. We also have a comprehensive set of economic indicators widely thought to be sensitive and reliable. Statistics on employment and unemployment, on retail and wholesale prices, and on the balance of payments are collected annually, quarterly, monthly, sometimes even weekly. These economic indicators are watched by government officials and private citizens alike as closely as a surgeon watches a fever chart for indications of a change in the patient's condition.

Although nations got along without economic indicators for centuries, it is hard to imagine doing without them now. It is hard to imagine governments and businesses operating without answers to questions which seem as ordinary as: What is happening to retail prices? Is national income rising? Is unemployment higher in Chicago than in Detroit? Is our balance of payments improving?

Indeed, economic indicators have become so much a part of our thinking that we have tended to equate a rising national income with national well-being. Many are suprised to find unrest and discontent growing at a time when national income is rising so rapidly. It seems paradoxical that the economic indicators are generally registering continued progress-rising income, low unemployment–while the streets and the newspapers are full of evidence of growing discontent-burning and looting in the ghetto, strife on the campus, crime in the street, alienation and defiance among the young.

Why have income and disaffection increased at the same time? One reason is that the recent improvement in standards of living, along with new social legislation, have generated new expectations–expectations that have risen faster than reality could improve. The result has been disappointment and disaffection among a sizeable number of Americans.

It is not misery, but advance, that fosters hope and raises expectations. It has been wisely said that the conservatism of the destitute is as profound as that of the privileged. If the Negro American did not protest as much in earlier periods of history as today, it was not for lack of cause, but for lack of hope. If in earlier periods of history we had few programs to help the poor, it was not for lack of poverty, but because society did not care and was not under pressure to help the poor. If the college students of the fifties did not protest as often as those of today, it was not for lack of evils to condemn, but probably because hope and idealism were weaker then.

The correlation between improvement and disaffection is not new. Alexis de Tocqueville observed such a relationship in eighteenth century France: "The evil which was suffered patiently as inevitable, seems unendurable as soon as the idea of escaping from it crosses men's minds. All the abuses then removed call attention to those that remain, and they now appear more galling. The evil, it is true, has become less, but sensibility to it has become more acute."

Another part of the explanation of the paradox of prosperity and rising discontent is clearly that "money isn't everything." Prosperity itself brings its own problems. Congestion, noise, and pollution are by-products of economic growth which make the world less livable. The large organizations which are necessary to harness modern technology make the individual feel small and impotent. The concentration on production and profit necessary to economic growth breeds tension, venality, and neglect of "the finer things."

WHY A SOCIAL REPORT OR SET OF SOCIAL INDICATORS?

Curiosity about our social condition would by itself justify an attempt to assess the social health of the nation. Many people want answers to questions like these: Are we getting healthier? Is pollution increasing? Do children learn more than they used to? Do people have more satisfying jobs than they used to? Is crime increasing? How many people are really alienated? Is the American dream of rags and riches a reality? We are interested in the answers to such questions partly because they would tell us a good deal about our individual and social well-being. Just as we need to measure our incomes, so we need "social indicators," or measure of other dimensions of our welfare, to get an idea how well off we really are.

A social report with a set of social indicators could not only satisfy our curiosity about how well we are doing, but it could also improve public policy-making in at least two ways. First, it could give social problems more visibility and thus make possible more informed judgments about national priorities. Second, by providing insight into how different measures of national well-being are changing, it might ultimately make possible a better evaluation of what public programs are accomplishing.

The existing situation in areas with which public policy must deal is often unclear, not only to the citizenry in general, but to officialdom as well. The normal processes of journalism and the observations of daily life do not allow a complete or balanced view of the condition of the society. Different problems have different degrees of visibility.

The visibility of a social problem can depend, for example, upon its "news value" or potential drama. The Nation's progress in the space race and the need for space research get a lot of publicity because of the adventure inherent in manned space exploration. Television and tabloid remind us almost daily of the problems of crime, drugs, riots, and sexual misadventure. The rate of infant mortality may be a good measure of the condition of a society but this rate is rarely mentioned in the public press, or even perceived as a public problem. The experience of parents (or infants) does not insure that the problem of infant mortality is perceived as a social problem; only when we know that more than a dozen nations have lower rates of infant mortality than the United States can we begin to make a valid judgment about the condition of this aspect of American society.

Moreover, some groups in our society are well organized, but others are not. This means that the problems of some groups are articulated and advertised, whereas the problems of others are not. Public problems also differ in the extent to which they are immediately evident to the "naked eye." A natural disaster or overcrowding of the highways will be immediately obvious. But ineffectiveness of an educational system or the alienation of youth and minority groups is often evident only when it is too late.

Besides developing measures of the social conditions we care about we also need to see how these measures are changing in response to public programs. If we mount a major program to provide prenatal and maternity care for mothers, does infant mortality go down? If we channel new resources into special programs for educating poor children, does their performance in school eventually increase? If we mount a "war on poverty," what happens to the number of poor people? If we enact new regulations against the emission of pollutants, does pollution diminish?

These are not easy questions, since all major social problems are influenced by many things besides governmental action, and it is hard to disentangle the different effects of different causal factors. But at least in the long run evaluation of the effectiveness of public programs will be improved if we have social indicators to tell us how social conditions are changing.

The present volume is not a social report. It is a step in the direction of a social report and the development of a comprehensive set of social indicators.

The report represents an attempt, on the part of social scientists, to look at several important areas and digest what is known about progress toward generally accepted goals. The areas treated in this way are health, social mobility, the condition of the physical environment, income and poverty, public order and safety, and learning, science, and art.

There is also a chapter on participation in social institutions, but because of the lack of measures of improvement or retrogression in this area, it aspires to do no more than pose important questions.

Even the chapters included leave many—perhaps most—questions unanswered. We have measures of death and illness, but no measures of physical vigor or mental health. We have measures of the satisfaction that income brings. We have measures of air and water pollution, but no way to tell whether our environment is, on balance, becoming uglier or more beautiful. We have some clues about their creativtiy or attitude toward intellectual endeavor. We have often spoken of the condition of Negro Americans, but have not had the data needed to report on Hispanic Americans, American Indians, or other ethnic minorities.

If the nation is to be able to do better social reporting in the future, and do justice to all of the problems that have not been treated here, it will need a wide variety of information that is not available now. It will need more data on the aged, on youth, and on women, as well as on ethnic minorities. It will need information not only on objective conditions, but also on how different groups of Americans perceive the conditions in which they find themselves.

We shall now summarize each of the chapters in turn.

HEALTH AND ILLNESS

There have been dramatic increases in health and life expectancy in the twentieth century, but they have been mainly the result of developments whose immediate effect has been on the younger age groups. The expectancy of life at birth in the United States has increased from 47.3 years at the turn of the century to 70.5 years in 1967, or by well over 20 years. The number of expected years of life remaining at age 5 has increased by about 12 years, and that at age 25 about 9 years, but that at age 65 not even 3 years. Modern medicine and standards of living have evidently been able to do a great deal for the young, and especially the very young, but not so much for the old.

This dramatic improvement had slowed down by the early fifties. Since then it has been difficult to say whether our health and life status have been improving or not. Some diseases are becoming less common and others are becoming more common, and life expectancy has changed rather little. We can get some idea whether or not there has been improvement on balance by calculating the "expectancy of healthy life" (i.e., life expectancy free of bed-disability and institutionalization). The expectancy of healthy life at birth seems to have improved a trifle since 1957, the first year for which the needed data are available, but certainly not as much as the improvements in medical knowledge and standards of living might have led us to hope.

The American people have almost certainly not exploited all of the potential for better health inherent in existing medical knowledge and standards of living. This is suggested by the fact that Negro Americans have on the average about seven years less expectancy of healthy life than whites, and the fact that at least 15 nations have longer life expectancy at birth than we do.

Why are we not as healthy as we could be? Though our style of life (lack of exercise, smoking, stress, etc.) is partly responsible, there is evidence which strongly suggests that social and economic deprivation and the uneven distribution of medical care are a large part of the problem.

Though the passage of Medicare legislation has assured many older Americans that they can afford the medical care they need, the steps to improve the access to medical care for the young have been much less extensive.

The nation's system of financing medical care also provides an incentive for the relative underuse of preventive, as opposed to curative and ameliorative, care. Medical insurance may reimburse a patient for the hospital care he gets, but rarely for the checkup that might have kept him well. Our system of relief for the medically indigent, and the fee-for-service method of physician payment, similarly provide no inducements for adequate preventive care.

The emphasis on curative care means that hospitals are sometimes used when some less intensive form of care would do as well. This overuse of hospitals is one of the factors responsible for the extraordinary increases in the price of hospital care.

Between June 1967 and June 1968, hospital daily service charges increased by 12 percent, and in the previous 12 months they increased by almost 22 percent. Physicians' fees have not increased as much—they rose by 5½ percent between June 1967 and June 1968—but they still rose more than the general price level. Medical care prices in the aggregate rose at an annual rate of 6.5 percent during 1965-67.

SOCIAL MOBILITY

The belief that no individual should be denied the opportunity to better his condition because of the circumstances of his birth continues to be one of the foundation stones in the structure of American values. But is the actual degree of opportunity and social mobility as great now as it has been?

It was possible to get a partial answer to this question from a survey which asked a sample of American men about their fathers' usual occupations as well as about their own job characteristics. Estimates based on these data suggest that opportunity to rise to an occupation with a higher relative status has not been declining in recent years, and might even have increased slightly. They also show that by far the largest part of the variation in occupational status was explained by factors other than the occupation of the father.

These encouraging findings, in the face of many factors that everyday observation suggest must limit opportunity, are probably due in part to the expansion of educational opportunities. There is some tendency for the sons of those of high education and status to obtain more education than others (an extra year of schooling for the father means on the average an extra 0.3 or 0.4 of a year of education for the son), and this additional education brings somewhat higher occupational status on the average. However, the variations in education that are not explained by the socio-economic status of the father, and the effects that these variations have on occupational status, are much larger. Thus, on balance, increased education seems to have increased opportunity and upward mobility.

There is one dramatic exception to the finding that opportunity is generally available. The opportunity of Negroes appears to be restricted to a very great extent by current race discrimination and other factors specifically related to race. Though it is true that the average adult Negro comes from a family with a lower socioeconomic status than the average white, and has had fewer years of schooling, and that these and other "background" factors reduce his income, it does not appear to be possible to explain anything like all of the difference in income between blacks and whites in terms of such background factors. After a variety of background factors that impair the qualifications of the average Negro are taken into account, there remains a difference in income of over $1,400 that is difficult to explain without reference to current discrimination. So is the fact that a high status Negro is less likely to be able to pass his status on to his son than is a high status white. A number of other studies tend to add to the evidence that there is continuing discrimination in employment, as does the relationship between Federal employment and contracts (with their equal opportunity provisions) and the above-average proportion of Negroes in high status jobs.

The implication of all this is that the American commitment to opportunity is within sight of being honored in the case of whites, but that it is very far indeed from being honored for the Negro. In addition to the handicaps that arise out of history and past discrimination, the Negro also continues to obtain less reward for his qualifications than he would if he were white.

THE PHYSICAL ENVIRONMENT

This chapter deals with the pollution of the natural environment, and with the man-made, physical environment provided by our housing and the structure of our cities.

Pollution seems to be many problems in many places—air pollution in some communities, water pollution in others, automobile junk yards and other solid wastes in still other places. These seemingly desperate problems can be tied together by one basic fact: The total weight of materials taken into the economy from nature must equal the total weight of materials ultimately discharged as wastes plus any materials recycled.

This means that, given the level and composition of the resources used by the economy, and the degree of recycling, any reduction in one form of waste discharge must be ultimately accompanied by an increase in the discharge of some other kind of waste. For example, some air pollution can be prevented by washing out the particles—but this can mean water pollution, or alternatively solid wastes.

Since the economy does not destroy the matter it absorbs there will be a tendency for the pollution problem to increase with the growth of population and economic activity. In 1965 the transportation system in the United States produced 76 million tons of five major pollutants. If the transportation technology used does not greatly change, the problem of air pollution may be expected to rise with the growth and the number of automobiles, airplanes, and so on. Similarly, the industrial sector of the economy has been growing at about 4-1/2 percent per year. This suggests that if this rate of growth were to continue, industrial production would have increased tenfold by the year 2020, and that in the absence of new methods and policies, industrial wastes would have risen by a like proportion.

The chapter presents some measures of air and water pollution indicating that unsatisfactorily high levels of pollution exist in many places. There can be little doubt that pollution is a significant problem already, and that this is an area in which at least in the absence of timely reporting and intelligent policy, the condition of society can all too easily deteriorate.

As we shift perspective from the natural environment to the housing that shelters us from it, we see a more encouraging trend. The physical quality of the housing in the country is improving steadily, in city center and suburb alike. In 1960, 84 percent of the dwelling units in the country were described as "structurally sound;" in 1966, this percentage had risen to 90 percent. In central cities the percentage had risen from 80 percent in 1960 to 93 percent in 1966. In 1950, 16 percent of the nation's housing was "overcrowded" in the sense that it contained 1.01 or more persons per room. But by 1960, only 12 percent of the nation's housing supply was overcrowded by this standard.

The principal reason for this improvement was the increased per capita income and demand for housing. About 11-1/2 million new housing units were started in the United States between 1960 and 1967, and the figures on the declining proportions of structurally unsound and overcrowded dwelling, even in central cities, suggest that this new construction increased the supply of housing available to people at all income levels.

Even though the housing stock is improving, racial segregation and other barriers keep many Americans from moving into the housing that is being built or vacated, and deny them a full share in the benefits of the improvement in the nation's housing supply.

INCOME AND POVERTY

The Gross National Product in the United States is about $1,000 higher per person than that of Sweden, the second highest nation. In 1969 our GNP should exceed $900 billion. Personal income has quadrupled in this century, even after allowing for changes in population and the value of money.

Generally speaking, however, the distribution of income in the United States has remained practically unchanged over the last 20 years. Although the distribution of income has been relatively stable, the rise in income levels has meant that the number of persons below the poverty line has declined. The poor numbered 40 million in 1960 and 26 million in 1967.

A continuation of present trends, however, would by no means eliminate poverty. The principal cause of the decline has been an increase in earnings. But some of the poor are unable to work because they are too young, too old, disabled or otherwise prevented from doing so. They would not, therefore, be directly helped by increased levels of wages and earnings in the economy as a whole. Moreover, even the working poor will continue to account for a substantial number of persons by 1974: about 5 million by most recent estimates. This latter group is not now generally eligible for income supplementation.

The nation's present system of income maintenance is badly in need of reform. It is inadequate to the needs of those who do receive aid and millions of persons are omitted altogether.

This chapter concludes with an analysis of existing programs and a discussion of new proposals which have been put forward in recent years as solutions to the welfare crisis.

PUBLIC ORDER AND SAFETY

The concern about public order and safety in the United States is greater now than it has been in some time.

The compilations of the Federal Bureau of Investigation show an increase in major crimes of 13 percent in 1964, 6 percent in 1965, 11 percent in 1966, and 17 percent in 1967. And studies undertaken for the President's Crime Commission in 1965 indicate that several times as many crimes occur as are reported.

Crime is concentrated among the poor. Both its perpetrators and its victims are more likely to be residents of the poverty areas of central cities than of suburbs and rural areas. Many of those residents in the urban ghettoes are Negroes. Negroes have much higher arrest rates than whites, but it is less widely known that Negroes also have higher rates of victimization than whites of any income group.

Young people commit a disproportionate share of crimes. Part of the recent increase in crime rates can be attributed to the growing proportion of young people in the population. At the same time, the propensity of youth to commit crime appears to be increasing.

Fear of apprehension and punishment undoubtedly deters some crime. The crime rate in a neighborhood drops with much more intensive policing. But crime and disorder tend to center among young people in ghetto areas, where the prospects for legitimate and socially useful activity are poorest. It seems unlikely that harsher punishment, a strengthening of public prosecutors, or more police can, by themselves, prevent either individual crime or civil disorder. The objective opportunities for the poor, and their attitudes toward the police and the law, must also change before the problems can be solved.

LEARNING, SCIENCE, AND ART

The state of the nation depends to a great degree on how much our children learn, and on what our scientists and artists create. Learning, discovery, and creativity are not only valued in themselves, but are also resources that are important for the nation's future.

In view of the importance of education, it might be supposed that there would be many assessments of what or how much American children learn. But this is not in fact the case. The standard sources of educational statistics give us hundreds of pages on the resources used for schooling, but almost no information at all on the extent to which these resources have achieved their purpose.

It is possible to get some insight into whether American children are learning more than children of the same age did earlier from a variety of achievement tests that are given throughout the country, mainly to judge individual students and classes. These tests suggest that there may have been a significant improvement in test score performance of children since the 1950's.

When the chapter turns to the learning and education of the poor and the disadvantaged, the results are less encouraging. Groups that suffer social and economic deprivation systematically learn less than those who have more comfortable backgrounds.

Even when they do as well on achievement tests, they are much less likely to go on to college. Of those high school seniors who are in the top one-fifth in terms of academic ability, 95 percent will ultimately go on to college if their parents are in the top socioeconomic quartile, but only half of the equally able students from the bottom socioeconomic quartile will attend college. Students from the top socioeconomic quartile are five times as likely to go to graduate school as comparably able students from the bottom socioeconomic quartile.

It is more difficult to assess the state of science and art than the learning of American youth. But two factors nonetheless emerge rather clearly. One is that American science is advancing at a most rapid rate, and appears to be doing very well in relation to other countries. The Nation's "technological balance of payments," for example, suggests that we have a considerable lead over other countries in technological know-how.

The other point that emerges with reasonable clarity is that, however vibrant the cultural life of the Nation may be, many of the live or performing arts are in financial difficulty. Since there is essentially no increase in productivity in live performances (it will always take four musicians for a quartet), and increasing productivity in the rest of the economy continually makes earnings in the society rise, the relative cost of live performances tends to go up steadily. This can be a significant public problem, at least in those cases where a large number of live performances is needed to insure that promising artists get the training and opportunity they need to realize their full potential.

PARTICIPATION AND ALIENATION: WHAT WE NEED TO LEARN

Americans are concerned, not only about progress along the dimensions that have so far been described, but also about the special functions that our political and social institutions perform. It matters whether goals have been achieved in a democratic or a totalitarian way, and whether the group relationships in our society are harmonious and satisfying.

Unfortunately, the data on the performance of our political and social institutions are uniquely scanty. The chapter on "Participation and Alienation" cannot even hope to do much more than ask the right questions. But such questioning is also of use, for it can remind us of the range of considerations we should keep in mind when setting public policy, and encourage the collection of the needed data in the future.

Perhaps the most obvious function that we expect our institutions to perform is that of protecting our individual freedom. Individual liberty is not only important in itself, but also necessary to the viability of a democratic political system. Freedom can be abridged not only by government action, but also by the social and economic ostracism and discrimination that results from popular intolerance. There is accordingly a need to survey data that can discern any major changes in the degree of tolerance and in the willingness to state unpopular points of view, as well as information about the legal enforcement of constitutional guarantees.

Though liberty gives us the scope we need to achieve our individual purposes, it does not by itself satisfy the need for congenial social relationships and a sense of belonging. The chapter presents evidence which suggests (but does not prove) that at least many people not only enjoy, but also need, a clear sense of belonging, a feeling of attachment to some social group.

There is evidence for this conjecture in the relationship between family status, health, and death rates. In general, married people have lower age-adjusted death rates, lower rates of usage of facilities for the mentally ill, lower suicide rates, and probably also lower rates of alcoholism than those who have been widowed, divorced, or remained single. It is, of course, possible that those who are physically or mentally ill are less likely to find marriage partners, and that this explains part of the correlation. But the pattern of results, and especially the particularly high rates of those who are widowed, strongly suggest that this could not be the whole story.

There are also fragments of evidence which suggest that those who do not normally belong to voluntary organizations, cohesive neighborhoods, families, or other social groupings probably tend to have somewhat higher levels of "alienation" than other Americans.

Some surveys suggest that Negroes, and whites with high degrees of racial prejudice, are more likely to be alienated than other Americans. This, in turn, suggests that alienation has some importance for the cohesion of American society, and that the extent of group participation and the sense of community are important aspects of the condition of the nation. If this is true, it follows that we need much more information about these aspects of the life of our society.

It is a basic precept of a democratic society that citizens should have equal rights in the political and organizational life of the society. Thus there is also a need for more and better information about the extent to which all Americans enjoy equality before the law, equal franchise, and fair access to public services and utilities. The growth of large scale, bureaucratic organizations, the difficulties many Americans (especially those with the least education and confidence) have in dealing with such organizations, and the resulting demands for democratic participation make the need for better information on this problem particularly urgent.

* * * *

Though almost all Americans want progress along each of the dimensions of well being discussed in this report, the nation cannot make rapid progress along all of them at once. That would take more resources than we have. The nation must decide which objectives should have the higher priorities, and choose the most efficient programs for attaining these objectives. Social reporting cannot make the hard choices the nation must make any easier, but ultimately it can help to insure that they are not made in ignorance of the nation's needs.

V *QOL*: PSYCHOLOGICAL PERSPECTIVES

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QUALITY OF LIFE

Norman C. Dalkey*

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QUALITY OF LIFE

N. C. Dalkey

INTRODUCTION

The phrase "*quality of life*" has almost supplanted the older words "happiness" and "welfare" in contemporary discussions of policy in the urban and domestic areas.* The phrase does have a fine ring to it and is somewhat less maudlin than "happiness" and somewhat less shopworn than "welfare." However, there is some question whether the brave new phrase is any less vague.

The expression is most often encountered as a slogan—a call to think bigger. There is nothing particularly objectionable in the sloganistic use; except that the term is rarely defined and one suspects that it contributes its bit of soot to the verbal smog—most of the users are careful not to pause for definition, but hurry on to more operational problems, like setting performance goals.

This is not the place to examine goal-oriented decision making. And, I am going to make a further simplification, which is to accept the restriction of social programs as aimed at doing something for the *individual*. Whether that is a reasonable attitude is, I believe, a wide open question, but I won't open it here. (What is involved is the question whether there are group interests which transcend the interests of the individual members of the group. It is my impression that there are—beside the standard ones of national security—but discussion of this issue would lead too far afield.)

There is a final simplification I would like to make before proceeding. The notion of "quality" has two elements: it can refer to state or condition, or it can refer to excellence. The difference is probably subtle, and mainly semantic; but life becomes a little simpler if we start off with a descriptive, rather than a prescriptive notion. This boils down to considering the aim to be the characterization of the factors which are relevant and important to the well-being of individuals, and not to prescribing what is socially good. (In my own framework, these two are not really distinct; but other frameworks exist, and I don't want to get tangled up in them at this stage.)

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* "These goals cannot be measured by the size of our bank balances. They can only be measured in the quality of the lives that our people lead." (Remarks of the President (Johnson), Madison Square Garden, October 31, 1964.) "But no one has compared the two modes of transport (SST, public urban transit) in terms which might reflect how they improve the *quality of life*." (System Science, Congress and the *Quality of Life*, feature article by Murray E. Kanross, IDA for WORC Newsletter, Sept. 1967.)

As you will observe I tend to be rather bullish about the feasibility of getting somewhere in the attempt to make the notion of *QOL** useful to planners (as more than a handy slogan). My reasons are pretty diffuse. There is a small but growing body of information in psychology that is relevant; there have been several studies by social scientists that are applicable; and there is a fair amount of agreement between armchair thinkers on the factors which are significant. This is not a sufficient basis for optimism—but it is a little better than an excuse.

I remarked earlier that few users of the phrase *QOL* bother to define it; however, some have attempted to give content to the notion, and it is worth examining these characterizations.

These attempts have taken two** forms, (a) armchair "analyses," and (b) public surveys.

The armchair approach generally consists of devising a list of general factors which are important to the *quality of life* of an individual. Representative samples are to be found in Bauer (2), Berelson (1), Lynd (3), SRI (4). A kind of super-armchair procedure is that of the prestigious commission, most notably the President's Commission on National Goals and Values (5). Again, the output is a list of items deemed (in this case) most important for the well-being of nation, and hence, derivatively, for the individual. The report of the President's Commission has become a sort of bible in the national area (6) (7). One investigator, Wilson (8), has used the list of goals as a structure to rank the 50 states in the order of the *quality of life* they offer their residents.

The public survey approach is well represented by two investigations, reported in (9) and (10). These are analyses of the results of extensive interviews with cross-sectional samples of the American public. Despite the somewhat Reader's Digest air lent these studies by their unabashed use of words like "happiness," "feelings," etc., they have the virtue that they at least *ask* the relevant questions, rather than imposing a priori assumptions.

Following a brief discussion of the armchair and public survey efforts, a research strategy is suggested that appears to go well beyond these two with respect to coherence and comprehensiveness.

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* This abbreviation of *Quality of Life* will be used intermittently below.

** I am excluding the host of ethical, aesthetic, and religious essays in this area, as well as the mass of clinical material in the psychoanalytic and mental hygiene areas; the first three because of lack of empirical claims, and the last two because of extreme miscellaneity.

ARMCHAIR EFFORTS

As noted above, the armchair approach consists in devising a list of general factors which are presumed to be significant in determining the well-being of humans. The lists referred to are, of course, not capricious. They are distilled from clinical lore, sociological think pieces, some psychological and social psychological experimentation, and the like. There is a great deal of overlap among the lists—in general the shorter lists tend to be contained bodily in the longer ones. The shortest list I have run across is that of SRI, which involves three basic factors:

Safety
Belongingness
Self-esteem

A fourth item is appended, self-realization, but this is treated on a different level than the basic three.

The oldest list of this genre I have run across is dated 1923 (Thomas, quoted in Berelson, p. 257) and is next to the shortest. Thomas adds "new experience." I cooked up a list semi-independently of the ones mentioned, and I suppose it is only fair that I use it as an example. The list contains nine items: Health, Activity, Freedom, Security, Novelty, Status, Sociality, Affluence, Aggression.

Strictly physiological items such as food, sleep, shelter, etc., have been omitted primarily on the grounds that, in the U.S., at least, these are pretty well taken care of at better than subsistence levels.

A number of dubieties arise at once concerning any attempt to set down a list of the significant factors in the *quality of life*. The lists are intended to be comprehensive, but the varying lengths of those in the literature indicate that there is no trustworthy stop rule for the multiplication of items. Again, the items are presumably distinct, but there is no good way of telling whether they overlap, or in fact refer to the same thing. Finally, the items are extremely difficult to relate on the one hand, to human behavior, and, on the other, to policy.

In an attempt to introduce a somewhat more systematic treatment (but still within the armchair tradition) I conducted a preliminary Delphi (14) exercise, using twelve RAND staff as a panel. They were asked to judge three things concerning the nine factors listed above: whether the items were a) meaningful,

b) measurable, and the relative weight of the factors for the *quality of life* of the average American.* They were also asked to add any new factors which they thought were significant.

There was good agreement that the items were meaningful, and good agreement that all were measurable except for Freedom, Novelty, and Aggression. There was considerable diversity on the values of the relative weights, but reasonable agreement on the ranking. In terms of proportionate parts of 100, the median relative weights were those in Table 1.

Table 1 Median Relative Weights of 12 Respondents for Nine Factors in Quality of Life

	Factor	Median Weight
1.	Health	20
2.	Status	14
3.	Affluence	14
4.	Activity	12.25
5.	Sociality	9.8
6.	Freedom	8.2
7.	Security	8.2
8.	Novelty	7.2
9.	Aggression	6.1

As can be seen, the items break up into three main groups, (1) Health, (2) Status, Affluence, Activity, (3) Freedom, Security, Novelty, with Sociality midway between (2) and (3) and Aggression rather by itself at the bottom.

How much this table reflects the RAND environment, I don't know. I had intended to pursue the exercise for at least another round, feeding back the results of the first round to the panel for further consideration; but I gave up for two reasons: 1) no procedure suggested itself for dealing with the overlap problem. The clustering of 2,3,4, and 5,6,7 indicated they might be describing one single factor each. 2) No procedure suggested itself for dealing with the completeness problem.

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* The questionnaire used for this exercise is included as an appendix.

The only two items suggested for addition by more than one member of the panel were sexual activity, and care of children (including education).

GENERAL CONSIDERATIONS

Without a good deal more empirical study than now exists, the armchair lists are probably only suggestive. However, they are in agreement on one general proposition: Whatever *QOL* is, it is determined mainly by some very general features of the individual and his environment, and not by specifics. What this means is that two different individuals who score about the same in a "factor space" should, for example, report about the same degree of contentment with their lot, irrespective of the special circumstances that make up the score. This is a very strong statement. Providing the factors are measurable, it is testable, and one of the problems to be tackled is how we can go about testing it.

A great deal of the issue is whether we are looking for a "single thing" that can be called *QOL*, or whether we presume it is a congeries of incomparable elements. There are several levels possible here: If we consider the factors to be—as Lynd (3) does—motivations, or forces, we can ask whether there are trade offs among them. If so, there is a reasonable sense in which "equi-motivating" curves can be drawn and a general "desirability" index defined. A somewhat different notion is involved in use of terms such as "happiness" to describe an overall "feeling-tone" to which the various status variables "contribute." A third point of view is that of the mental hygienist which apparently would include some notion of the effectiveness of the individual, as well as his "feeling-tone."

In the present discussion I vacillate between the three. My prejudices lead me to favor the mental health approach, but the difficulties of implementing this approach for purposes of systems analysis in domestic problems nudge me toward the simpler structures.

In addition to the very general postulate that *QOL* is determined by some highly abstract properties of the living space of the individual, there are two other propositions for which there seems to be a fair amount of evidence: The first is that the influence of factors on *QOL* are a rapidly decreasing function of distance away, either in space or time. The statement with respect to time is very similar to the notion of discount rate in economics. The opportunity of obtaining a dollar one year from now is much less motivating than the opportunity to obtain a dollar this afternoon. With regard to space, there has been a fairly rich experimental program with animals, and especially with rats, demonstrating the properties of what the psychologist Clark L. Hull called the *goal gradient*. If any of several indicators of motivation are employed (velocity with which the rat runs toward a goal, the physical tug the rat exerts against a restraint, which can be measured by a harness and a spring balance, etc.,) the general relationship of this measure and distance from the goal is that of an exponential decrease (see Figure 1).

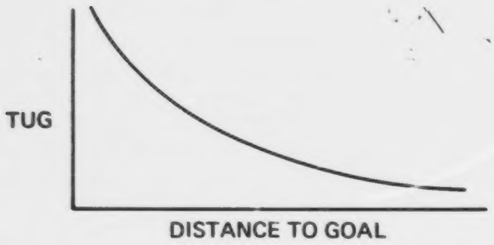

Figure 1

One of the most beautiful sets of experiments in all psychology demonstrates the interaction of positive and negative goal gradients (11). In a given maze, the positive goal gradient, e.g., for food, can be measured. Suppose for the same maze, a negative goal gradient is measured, e.g., for an electric shock. The curve will again look like Figure 1, except, of course, the effect is a push away from the "goal" rather than a tug. Now, suppose the rat is faced with the situation where there is food and an electric shock at the goal position. It appears to be the case that the decline of the negative "force" is more rapid than the decline of the positive force, hence the two curves will cross, as in Figure 2.

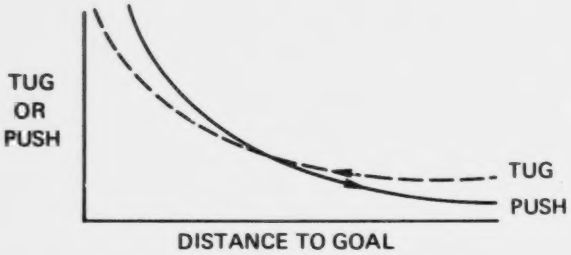

Figure 2

The remarkable thing is that although the two curves were measured independently, when the goal is mixed, the rat will approach the goal until he reaches the crossover point, and then stop. If he is placed closer to the goal than the crossover point, he will retreat to the crossover and again stop. If he is placed precisely at the crossover, he will remain there. In short, the reality of the equality of the push and the tug is elegantly borne out.

Probably, even for rats, but certainly for humans, the goal gradient would need modification in terms of psychological distance, as well as physical distance; although it is striking that sheer physical distance appears to be sufficient for many psychological and sociological phenomena. In particular, Zipf (12) has found some surprising relationships between distance and social interactions.

The other general proposition is that human beings probably live much more "in the future" than lower animals. Hope, anticipation, ambition, aspiration level, anxiety, etc. are clearly important elements of *QOL*. But it seems reasonable to assume that events of the distant future are much less influential than near events. It also seems reasonable that the "discount rate" depends on the kind of event and the amount of uncertainty surrounding it. I don't know of any experiments in which the time-wise goal gradient for animals has been systematically investigated, but it looks like a tractable subject.

SURVEY

A somewhat more empirical approach is furnished by the cross-sectional survey. The two studies "Americans View Their Mental Health" (1960) (9) and "Reports on Happiness" (1966) (10) are among the more complete and recent such surveys. The procedure is reasonable, if a little uninspired. Lengthy interviews (of the order of two hours involving over a hundred questions) were held with cross-sectional samples of the population. Questions ranged from the subjective and global (Taking all things together, how would you say things are these days—would you say you're very happy, pretty happy, or not too happy these days?) to the objective and specific (About what do you think your total income will be this year for yourself and your immediate family?...list of income brackets.)

Such surveys are subject to a host of well-known objections. These were recognized by the investigators, but, of course, are hard to deal with. It is difficult to check the reliability of verbal reports; they are hard to relate to behavior; subjective evaluations are subject to bias and cultural distortion, etc. In addition, the survey approach has very little in the way of conceptual framework to suggest hypotheses and structure.

Nevertheless the survey results are not empty. For one thing, they overturned several well-entrenched bits of popular sociology. A good example is the myth of the carefree bachelor. Standard lore has it that the single man enjoys his freedom, while the single woman is anxiously awaiting the loss of hers. Something like the opposite appears to be the case. The unmarried male is much more likely to rate himself as "not very happy" than the unmarried female.

An interesting result from the "Reports on Happiness" study is that a succession of events, some with positive and some with negative feeling tones do not smear into an intermediate shade of emotional grey, but make distinct contributions to a self-evaluation. Persons reporting being very or pretty happy are likely to report a greater number of both unpleasant and pleasant events in the recent past than those reporting being not very happy.

For those interested in urban affairs, the surveys raise somewhat of a puzzle. In comparing self-evaluations of urban and rural dwellers, no measurable difference could be found when respondents were matched for other obvious variables–age, sex, education, income, married or not. Admittedly, the measuring stick is crude, but at least the other variable mentioned did make a distinct difference.

A RESEARCH PROPOSAL

In this section a research proposal will be outlined that represents an attempt to be somewhat more systematic in studying the *quality of life* than either the armchair or survey approaches. The pros and cons will be left to a later section.

The basic idea is quite straightforward, namely, to prepare a comprehensive set of scales relevant to the *quality of life*; let a large, representative sample of Americans rate themselves on these scales via confidential interview; and employ factor analysis to summarize the interrelation between the ratings. With any luck at all, many of the factors derived in the analysis would be interpretable and could replace the armchair lists with something more solid. However, this felicitous result is not vital to the usefulness of the study.

The scales would consist of three sorts: a) relatively objective measures such as income, age, amount of communication with friends, etc., b) subjective ratings such as job satisfaction, perceived social status, degree of excitement in daily activities, etc., c) global subjective scales like happiness, amount of worry, number of times thought of suicide, optimistic about future, etc.

Since one expectation would be that the results of such a study would be relevant to policy in the urban and domestic areas, several blocks of scales should be allocated to issues directly involved in these, e.g., amount of time spent in parks and places of public recreation, satisfaction with neighborhood, amount of income from welfare payments, and so on. In light of the large role that aesthetic and "cultural" considerations play in the deliberations of many urban planners it would seem reasonable to include a number of scales relevant to this dimension.

Obviously, one of the great difficulties with the study would be to include the "dark" areas–aggression, antisocial behavior, bigotry, and the like. The presumption that the *quality of life* is determined solely by "acceptable" items is, of course, false; but probably on a first go round, the dark items would have to be under-emphasized. On the other hand, there is no reason to leave them out– the President's Commission on Crime (13) had no difficulty in pursuing the question whether respondents had committed one or more serious crimes. 90% had.

The most critical part of the study, and the one that would probably consume a majority of the elapsed time is the construction and selection of the set of primary scales. There is an essentially limitless potential set of such indices. A large proportion of the items could probably be derived from the extensive literature on sociometrics. The armchair lists can be used for some guidance. However, an intensive preexamination by a panel of social psychologists would undoubtedly be required. In addition, several pilot runs to test the reliability and where feasible, the "validity" of the items would be needed.

An extremely useful substudy would be to combine the *quality of life* questionnaire with a personality inventory and an intelligence test. The problem here would be to find a meaningful small group of respondents–it obviously would be of limited value to use only college graduate students.

The less difficult part would be conducting the survey and initial analysis of the data. The interviewing would doubtless be done most efficiently by one of the established survey groups, and computer routines exist to carry out the very large amount of computation required for the factor analysis. Summative analysis and drawing conclusions would certainly not be routine.

PROS AND CONS

There are a number of negative considerations with regard to the research proposal sketched above. All of the difficulties with using "verbal behavior" previously noted in connection with public surveys still apply. It is likely that some increase in reliability will accrue from the statistical aggregation in the factor analysis, but this is not a large effect compared with the questionable aspects of relying on verbal reports. In addition, it is easy to oversell the significance of factor analysis. The technique itself has some formal drawbacks–principally that it is not independent of irrelevant indices–and the question whether the derived factors are "real" or simply statistical artifacts is generally an open one. In the case of the *quality of life* analysis there is a form of internal criterion of meaningfulness, in that it is possible to include a number of "global" scales, and the degree to which the derived factors can be used to estimate the global indices can be assessed. However, this internal criterion is of limited weight with respect to the question whether the derived factors are related to behavior or to the effects of varying the environment of an individual. There is, in fact, a nondismissable question whether all the analysis is doing for you is shortening your dictionary.

Not to be overlooked is the fact that a study of this scope would be expensive.

Despite these reservations, there are several reasons for urging that the study be undertaken. Above all, the factor analytic approach–whatever the ultimate significance of the derived factor structure–furnishes a systematic framework for tying together a vast amount of information about the perceived well-being of present day Americans. It should be a fertile source of hypotheses concerning the interrelation of various influences on the *quality of life*. It clearly is several steps beyond the armchair approach in both empirical content and in rationale for assessing the importance of various factors. (In this respect, "shortening the dictionary" has by itself a nontrivial payoff.)

The discipline imposed by the analysis on the basic scales should result in a much sharper set of measures. And, of course, one would expect to cut through at least parts of the great mass of common *mis*understandings concerning the interrelations of these measures. There is a reasonable expectation that for many of the derived factors, there would be a high enough correlation with *objective* measures so that relating public programs to the *quality of life* could be accomplished via these indices.

A HIERARCHY OF NEEDS AND VALUES

Graham T. T. Molitor

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Extracted from "Evolution of Socio-Economic Organization–A Structural Underpinning for Understanding Societal Value" by Graham T. T. Molitor. Presented to: Ad Hoc Interagency Committee on Futures Research, April 20, 1972.

A HIERARCHY OF NEEDS AND VALUES

Graham T. T. Molitor

One recent prediction states that "within less than a generation in the United States *two percent* of the population may be able to produce all the food and manufactured goods." The statement, perhaps extreme, dramatically makes the point that the traditional industries–agricultural and manufacturing–are declining in terms of the commitment of human resources, while output continues to increase at incredible rates.

Agrarian pursuits at an early stage in national development involved perhaps 90% of the labor force. Underdeveloped nations nearly 100% of the populace may be so committed, even today. As recently as the turn of the century some 35% of America's workers were involved in agriculture. Today only 4.4% of the labor force is involved and–realistically–that figure might decline to 2% by the year 2000. Agriculture has passed from an atomistic, labor intensive activity to a large-scale, capital intensive kind of operation.

Agriculture's biggest problem is no longer scarcity, but rather abundance. So prodigious is the output that a welter of laws actually restrain output, restrict acreage, discourage planting, and ban importation of competing foreign products. Despite all this, America not only has enough food to go around, but is capable of feeding a sizable portion of the world, as well.

Manufactured goods production seems headed the same way.

The industrial stage in economic evolution dominated until the 1950's when the post-industrial or service economy emerged. In about 1956 America became the first nation in all the history of the industrialized world where the number of manual or blue collar workers was exceeded by so-called white collared occupations. Around 1956, the service-producing industries (trade, finance, services, real estate, public utilities, transportation, and government) took the lead over jobs in the goods-producing industries.

The service economy has been born. Presently some 24% of the labor force are blue collar workers. The number may decline downward to some 11% before the end of this century.

The steady eclipse of traditional industrial pursuits–agriculture and manufacturing–brings on many significant changes that will profoundly alter the business structure, and our values systems.

. Incentives to *discourage* people from working may be devised.

- Work may become a ***privilege*** and a coveted status symbol, not a necessity.
- Life ***without work*** from cradle to grave may be possible.
- Use of ***leisure*** time may become our main preoccupation.
- An economy of ***abundance***, not one of scarcity may prevail.
- Undreamed of ***equality***, of economic sharing may become possible.

One prominent writer (Peter Drucker) has predicted the emerging post-industrial state will be dominated by knowledge/information industries. If matters of the mind and intellectual genius become tomorrow's dominant resource, it means that individuals will enjoy a new permanence and importance. A new era of humanism may be in prospect.

Such changes may alter traditional concepts of property. In a knowledge-based society the traditional wealth generating mechanisms of property and physical resources are no longer the central or crucial assets–the new resources will be the intellect, a very highly individualized kind of inner resource.

In turn, this could bring about the "reprivatization" of industry. Economic activity will no longer be dependent upon huge aggregations of property and wealth. Instead, new economic pursuits will be based upon the individual intellect. New opportunities for small, individual entrepreneurships–cottage industries–may flourish. In this process, not only may the composition of the work force change, but the very structure of organized economic activity may be radically reformed.

Ramifications of the knowledge industries becoming the dominant economic activity of the future are broad scale.

Tomorrow's critical shortage will be knowledge. Electrical data processing makes possible a global sharing and centralization of man's collective wisdom–such a "global data bank" will bring new intellectual horizons within grasp. In the ensuing competition for men's minds world-wide brain drains might come about.

Assuming education will remain primarily a government-operated service activity, the main enterprise of tomorrow takes on a statist or socialized cast. Such a turn of events may bring the economies–and interests–of the recognized socialist and even the communist countries ever closer together to the capitalist ones.

THE CHANGING CHARACTER OF SOCIOECONOMIC ACTIVITY

Whatever the exact outcome, some broad outlines of the changing character of socioeconomic activity are becoming apparent. Already well underway are the following basic shifts:

- From primary and secondary industries (agriculture/manufacturing) to tertiary and quaternary industries (service/knowledge activities)
- From Maslowian values posted on survival to security, then belongingness and esteem, and ultimately to self-actualization
- From goods to services
- From goods/services produced by muscle power to those produced by machines and cybernetics
- From unassisted brainpower to knowledge assisted and amplified by EDP
- From materialistic to the sensate
- From "things" to experiences
- From basic necessities then to amenities and eventually to a higher order of sensate needs
- From physiological to psychological needs
- From scientific emphasis based on physical, "hard" sciences to one based on social, "soft" sciences
- From "have not" (poverty) to "have" (shared abundance; egalitarianism)
- From quantity to quality
- From a few innovative technological introductions to vast and varied new inventions
- From scarcity to abundance and eventually to super abundance
- From a few stark choices to a bewildering array of choices

- From durability to disposables and planned obsolescence and back to recyclables, reclaimables
- From ownership to rentalism
- From self-interest motivation to broader social and humanitarian outlook
- From independence and self-sufficiency to interdependence
- From generalists to specialists
- From individual freedom to voluntary restraints to mandatory restraints
- From profit-mindedness to balanced consideration of social responsibilities and the public interest
- From Puritan hard-work ethic to leisure as a matter of right
- From Darwinian self-survival to humanistic security
- From atomistic to large-scale pluralistic institutions
- From national to multi-national and "one-world" scale operations
- From decentralization to centralization and eventual globalization
- From the simple to the complex
- From the obvious to subtle, non-discernible (X-rays, radiation)
- From irrational chaos to logical planning

EPOCHAL CHANGE

Americans are experiencing an epochal transmutation of the society they live in. Many don't even know it, although intuitively they may be aware of it. In the following comments I will begin to describe some of the powerful structural forces giving rise to the epochal transition period America is going through.

A post-industrial values revolution is at the bottom of the baffling succession of anti-thesis that are crowding in upon us all—anti-establishmentarianism, anti-materialism, rejection of the Puritan ethic of hard work, radicalization, counter-culture. The most important change is the massive search for QUALITY.

The sharp shift in values which is revolutionizing consumer behavior has been brought on–basically–by unprecedented affluence and abundance. An enormous middle and upper class, the largest ever known in the history of mankind (including some 90% of all Americans) are in the process of defining new goals with which are associated higher values. The new framework of human values involves satisfying ever-higher human needs.

Through an understanding of this constant human upgrading process–a constant striving to continually improve the social lot of mankind–we can appreciate the forces of consumerism which seem to be demanding more and more rational information useful to upgrading the *quality of life*; the demand for zero defects in product safety, and zero discharge in water pollution.

Values, then, are at the bottom of this understanding. They define ideas which unleash aspirations that eventually become the goals toward which society, as a whole, inevitably strives.

THE FIVE MASLOWIAN LEVELS

Maslow describes the five different stages or phases through which society evolves in his "needs hierarchy":

Level 1–Survival. Here the dominant driving force is simply the struggle to sustain life, to secure food, drink, sleep, warmth. This state involves scarcity and extreme poverty. Primitive man, social outcasts, and severe defectives fall into this category as do prisoners in POW camps–to these persons survival is all important. Little else counts.

Level 2–Security. Persons living within this socioeconomic environment are motivated by a desire for protection–from beasts, from people, from natural or economic catastrophies. Individuals are afraid of chaos and seek the familiar, security in numbers–the outlook is basically status quo. Minorities, the poor, marginal farmers, and small businessmen fall within this category.

Level 3–Belongingness. People at this level of social activity strive to be a part of something bigger, conform to group norms ("organization men"), depend upon the opinion of others. The mass middle class falls into this category.

Level 4–Esteem. People in this category are goaded by achievement that is "visible," ostentatious; they want to stand out and have others think well of them; materialism, and "keeping up with the Joneses" pervades this social strata. Within this category are business executives, politicians, and nouveaux riches.

Level 5–Growth or Self-Actualization. Living up to one's full potential is the primary concern at this level of development. Individuals within this social strata are tempered by idealism, motivated by ends not means, willing to follow–or to lead. They have an abiding conviction that the world can be better, their outlook is dominated by social awareness, and with a future-oriented and global perspective.

SELF-ACTUALIZERS–THE VANGUARD OF CHANGE

It is this process of inward turning–self-actualization or realization (level 5)–that is central to understanding the quest for quality and the elusive goal of perfection that grips us. All previous levels are motivated by quantitative needs; however, self-actualizers become all-concerned with quality.

In a post-industrial society persons falling into level 5 are increasing. As they increase in numbers their role as opinion leaders and trend setters becomes increasingly important. Although the real power over the socioeconomic system is wielded by those within the esteem group (level 4), the thinking of those in the esteem group is significantly shaped by opinion leaders in the self-actualization category.

Self-actualizers are the advocates of change. We need to carefully listen to them. More often than not, they are the cutting edge of change. Maslow stops at self-actualization. It always bothered me that he never went any further. Other psychologists describe where we go from here. One now obscure commentator may become world famous for his work–Clare Graves (Union College, New York) whose values system goes far beyond Maslow.

THE DELPHI PROCEDURE AND RATING *QUALITY OF LIFE* FACTORS*

Norman C. Dalkey and Daniel L. Rourke

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*This article is an extraction from the larger report, " Experimental Assessment of Delphi: Procedures With Group Value Judgments" by Norman C. Dalkey and Daniel L. Rourke: Rand, 1971, pp 8-24.

THE DELPHI PROCEDURE AND RATING *QUALITY OF LIFE* FACTORS

Norman C. Dalkey and Daniel L. Rourke

This document describes the method used in an experiment assessing the appropriateness of Delphi procedures for group value judgments.

In this study one group of subjects used the Delphi procedure to rate the relative importance of each of a set of factors in terms of the factor's contribution to a person's assessment of the *Quality of Life*. (In our instructions to the subjects *we defined the term "Quality of Life" (QOL) to mean a person's sense of well-being, his satisfaction or dissatisfaction with life, or his happiness or unhappiness.)* A second group used the Delphi method to scale a set of changes in characteristics of students occurring as a result of their participation in the process of higher education. This scale measured the Effects of Education (EE) in terms of the importance of the changes for the student. These topics were selected because our subject population (UCLA upper-division and graduate students) could be expected to have informed opinions concerning each of them. The two groups received nearly the same instructions for the different topics and were for the most part treated identically.

The experiment required three sessions, the first two of which were devoted to the generation of the items to be scaled by the Delphi method in the third session. In the first session, each subject made up a list of from 5 to 10 items important either for the assessment of the *Quality of Life* or for the evaluation of the Effects of Education on students.

The items from the *QOL* group (about 250 in all) were sorted into 48 categories of similar items, while the 300 items from the EE group were sorted into 45 categories. In the second session of the experiment the subjects who had made up the lists of items in response to the *QOL* questionnaire rated the similarity of all possible pairs of categories formed from the original *QOL* items. The EE group rated the similarity of all pairs of the EE categories. The similarity ratings were used to cluster the categories of the original items into super-categories. Thirteen super-categories or factors were formed from the *QOL* categories and fifteen from the EE categories. The relative importance of each factor was assessed during the third session of the study. The *QOL* group rated the importance of the *QOL* factors and the EE group rated the EE factors. A two-round Delphi procedure was employed where both groups revised their importance ratings during the second round in view of the median ratings for each factor obtained from the group's first-round ratings. As a check on the reliability of the ratings, the *QOL* and EE groups were each split into two subgroups and each subgroup used a different procedure to scale the factors.

SUBJECTS

The subjects were 90 UCLA upper-division and graduate students. They were recruited by advertisements in the school paper and were paid for their participation. No attempt was made to select subjects according to sex or field of interest.

ITEM GENERATION

During the first session, which was conducted at UCLA, subjects were instructed to list from 5 to 10 items pertaining either to the *Quality of Life* or the "Effects of Education." The subjects were randomly assigned to a particular topic so that 45 subjects responded to each.

Subjects in the two groups were treated identically. The subjects were given printed instructions and a deck of 10 blank cards. The instructions briefly introduced the subject to the purpose of the experiment and then requested him to list from 5 to 10 items (one item per card) pertaining either to the *QOL* or the EE topic.

In the *QOL* condition, subjects were asked to list the characteristics or attributes of those events having the strongest influence on determining the *QOL* of an adult American. The subjects were instructed to ignore events concerned with basic biological maintenance, but not to overlook characteristics with negative connotations, e.g., aggression. Subjects in the EE condition were asked to view higher education as a process which causes (or fails to cause) changes in characteristics of students. The subjects were requested to list those characteristics which should be considered in evaluating the process of higher education. Subjects were instructed to consider only undergraduate education while forming their lists.

Subjects were also instructed to rank their items from most important to least important. These ranks were used only as rough guides in the initial aggregation of items by the experimental team. Questions concerning the experiment were answered either by repeating or paraphrasing the instructions. No subject required more than half an hour to complete the first session. They were then given appointments for the second and third sessions which were conducted at The Rand Corporation in Santa Monica at intervals of one week.

Prior to the second session of the experiment, the items generated by the subjects in the first session were sorted into categories of similar items. Two sets of categories were formed: one for the *QOL* items and another for the EE items. The sorting was done by a panel of three; each member assisted in the design and execution of the experiment. Two criteria were used during the sorting of the items: (1) The perceived differences of any pair of items within a category were to be smaller than differences between any pair of items drawn from two different categories; and (2) No more than 50 categories were to be formed. Composite labels were developed for each category either by quoting or paraphrasing (or both) a few of the most frequently occurring items in each of the categories. The 48 *QOL* category composite labels are given in Table 1 and the 44 EE composite labels are shown in Table 2.

During the second session, each subject was presented with a list of all possible pairs of either the *QOL* or EE category labels. The task for all subjects was to rate the similarity of the labels in each pair. Every subject was given printed instructions, a list of the category labels, and a computer-generated list of pairs of labels. Each subject received a different random ordering of label pairs. The instructions informed the subjects that the items they had developed during the first session had been categorized to form the list of category labels. This list had in turn been used to form the computer printed list of label pairs. The subjects were instructed to rate the similarity of the labels in each pair on a 0-4 scale where the numerical ratings were tied to the following adjective scale:

4	Practically the same
3	Closely related
2	Moderately related
1	Slightly related
0	Unrelated

If a subject felt that the labels were connected, but in an inverse fashion, he was to use negative ratings, e.g., -4 being equivalent to "practically opposites." The following two examples were given: Drowsy - Physically Tired, illustratively scored at 2, and Drowsy - Alert, scored at -3. Both groups received the same instructions. The *QOL* group rated 1128 item pairs and the EE group rated 990. The experiment was conducted in two 1-1/4-hour periods with a 1/2-hour break between periods.

The means of the absolute values of the similarity ratings for each label pair were computed over subjects for both groups. These mean absolute ratings were then analyzed by Johnson's hierarchical clustering procedure (8). In this procedure objects are clustered according to the similarities between them. The objects within a cluster are more similar to one another than to objects belonging to a different cluster. In addition, the procedure merges similar clusters into larger clusters in a stepwise fashion until all the objects are placed into a single cluster. Consequently, the user of this procedure must select the number of clusters which seems compatible with both the data and any theoretical or empirical predictions about the results of the procedure. The problem is not unlike selecting the number of factors to retain in a factor analysis. The use of the absolute values of the ratings "folds" the label pairs given the negative

Table 1. Characteristics of Quality of Life

1. FEAR, ANXIETY
2. AGGRESSION, VIOLENCE, HOSTILITY
3. AMBITION
4. COMPETITION, COMPETITIVENESS
5. OPPORTUNITY, SOCIAL MOBILITY, LUCK
6. DOMINANCE, SUPERIORITY
7. MONEY, ACQUISITIVENESS, MATERIAL GREED
8. COMFORT, ECONOMIC WELL-BEING
9. NOVELTY, CHANGE, NEWNESS, VARIETY, SURPRISE
10. HONESTY, SINCERITY, TRUTHFULNESS
11. TOLERANCE, ACCEPTANCE OF OTHERS
12. STATUS, REPUTATION, RECOGNITION, PRESTIGE
13. FLATTERY, POSITIVE FEEDBACK, REINFORCEMENT
14. SPONTANEITY, IMPULSIVE, UNINHIBITED
15. FREEDOM
16. COMMUNICATION, INTERPERSONAL UNDERSTANDING
17. LONELINESS, IMPERSONALITY
18. DEPENDENCE, IMPOTENCE, HELPLESSNESS
19. POWER, CONTROL, INDEPENDENCE
20. GOOD HEALTH
21. FAILURE, DEFEAT, LOSING
22. INVOLVEMENT, PARTICIPATION
23. LOVE, CARING, AFFECTION
24. SELF-RESPECT, SELF-ACCEPTANCE, SELF-SATISFACTION
25. SELF-KNOWLEDGE, SELF-AWARENESS, GROWTH
26. SELF-CONFIDENCE, EGOISM
27. SECURITY
28. CHALLENGE, STIMULATION
29. PRIVACY
30. BOREDOM
31. ESCAPE, FANTASY
32. CONCERN, ALTRUISM, CONSIDERATION
33. HUMOR, AMUSING, WITTY
34. RELAXATION, LEISURE
35. SEX, SEXUAL SATISFACTION, SEXUAL PLEASURE
36. SUCCESS
37. ACHIEVEMENT, ACCOMPLISHMENT, JOB SATISFACTION
38. FAITH, RELIGIOUS AWARENESS
39. PEACE OF MIND, EMOTIONAL STABILITY, LACK OF CONFLICT
40. SUFFERING, PAIN
41. STABILITY, FAMILIARITY, SENSE OF PERMANENCE
42. INDIVIDUALITY
43. HUMILIATION, BELITTLEMENT
44. BEING NEEDED, FEELING OF BEING WANTED
45. CONFORMITY
46. SOCIAL ACCEPTANCE, POPULARITY
47. FRIENDSHIP, COMPANIONSHIP
48. EDUCATIONAL, INTELLECTUALLY STIMULATING

Table 2. Characteristics of Effectiveness of Higher Education

1. SELF-AWARENESS, INCREASED SELF-UNDERSTANDING
2. MATURITY
3. ABILITY TO LEARN, LEARNING TO LEARN
4. CRITICAL ABILITY, QUESTIONING, DEVELOPMENT OF A CRITICAL ATTITUDE
5. HONESTY, PERSONAL INTEGRITY
6. CURIOSITY, DESIRE TO LEARN MORE
7. SOCIAL AWARENESS, AWARENESS OF OTHERS
8. SOCIAL CONTACTS, OPPORTUNITY TO MEET A VARIETY OF PEOPLE
9. TOLERANCE, DECREASE IN PREJUDICES
10. OPEN-MINDEDNESS
11. UNDERSTANDING OF OTHERS
12. CULTURAL AWARENESS
13. SOCIAL ISSUES, AWARENESS OF SOCIETAL PROBLEMS
14. SOCIAL SKILLS, ABILITY TO GET ALONG WITH OTHERS
15. BROADER OUTLOOK, NEW PERSPECTIVES, SCOPE
16. POLITICAL MATURITY, POLITICAL AWARENESS
17. COMMUNICATION SKILLS
18. KNOWLEDGE
19. DEHUMANIZATION, REPRESSIVE BUREAUCRACY
20. CAREER SKILLS, JOB COMPETENCE
21. SPECIALIZATION, NARROWING OF INTEREST TO OWN FIELD
22. REASONING ABILITIES, ABILITY TO THINK
23. SELF-CONFIDENCE, SELF-RELIANCE, INDEPENDENCE
24. IRRELEVANCY, PRESCRIBED EDUCATION, EDUCATIONAL TRIVIA
25. MOTIVATION, COMPETITIVENESS
26. IMPRACTICAL EDUCATION, DISILLUSIONMENT WITH EDUCATIONAL USEFULNESS
27. LOSS OF CREATIVITY, LOSS OF CREATIVE THINKING
28. GREATER CREATIVITY, EXPANDING THE IMAGINATION
29. LOSS OF IDEALISM, GENERAL DISSATISFACTION
30. RESPONSIBILITY
31. SEXUAL MATURITY, MORE LIBERAL SEXUAL ATTITUDE
32. POLITICAL DISILLUSIONMENT
33. NEW EXPERIENCES, EXPOSING TO NEW ACTIVITIES
34. NARROWING OF OUTLOOK, NARROWING OF VALUES
35. SELF-RESPECT, SELF ACCEPTANCE, SELF-SATISFACTION
36. DEPENDENCY, PROLONGED YOUTH
37. SYNTHESIZING ABILITY, A SENSE OF ORGANIC RELATIONSHIP
38. AWARENESS OF ENVIRONMENT, RELATIONSHIP OF INDIVIDUAL WITH ENVIRONMENT
39. LIBERALIZATION OF SOCIAL AND POLITICAL VIEWS
40. PURPOSE IN LIFE, DEVELOPMENT OF LIFE GOALS
41. ELITISM, SOCIAL STATUS
42. INVOLVEMENT, POLITICAL INVOLVEMENT
43. CONCERN FOR SOCIETY, FELLOWMAN
44. RELATING TO OTHERS

ratings into the same clusters. The clusters which were generated by this procedure are shown in Figure 1 for the *QOL* groups and Figure 2 for the EE group. Numbers across the top refer to the list of items in Tables 1 and 2 respectively. The lefthand column indicates the similarity level at which the item is included in a cluster. The "histogram" of x's displays the progressive aggregation of items into clusters. For example, in Figure 1 at the highest level of similarity (3.78) Failure (21) and Success (35) are associated—probably as straightforward opposites. At almost the same level, Achievement (37) is joined to the cluster. Nothing further is added to this cluster until level 1.9 when the previously associated pair, Money (7) and Status (12) are added. This is the "core" of characteristic 11 in Table 3. The thirteen *QOL* and fifteen EE clusters which were selected are given in Tables 3 and 4.

IMPORTANCE RATING

The task for the subjects in the third session of the experiment was to rate the clusters or factors in terms of their importance to the topic in question. The subjects who had developed the *QOL* factors rated them as did the subjects who generated the EE factors. The design of this session is shown schematically in Table 5. As can be seen in Table 5, the *QOL* and EE groups were each split into two subgroups, and each subgroup used a different scaling procedure. During the third part of the session, the *QOL* and EE group both rated the relevance of each of the EE factors in terms of its contribution to each of the *QOL* factors. Otherwise, the groups were treated identically.

In order to familiarize the subjects with the factors they would be rating, they were instructed to look over the factors and devise a convenient word or phrase label for each. The subjects were then asked to rate their self-confidence in working with each of the factors on a 1 to 5-point scale. The factors they felt most confident about were to receive a 5 and those they felt least confident about were to receive a 1. Next the subjects were requested to rate the relative importance of each factor in terms of the contribution of that factor to the general topic. Using the split-100 (S-100) procedure, *QOL* Group 1 and EE Group 1 were instructed to distribute 100 points among the factors so that the most important factors received the most points. Using the magnitude-estimation (M-E) procedure *QOL* Group 2 was instructed to find the most important factor and give it a rating of 100. Then this group was asked to rate the other factors in terms of the most important one, so that a factor which they felt was half as important as the most important was to receive a rating of 50. The group using the rating scale (7-pt) procedure (EE Group 2) was asked to use a 1- to 7-point scale to rate the factors; a rating of 1 was to apply to "unimportant" factors, 4 to "moderately important" ones, and 7 to "extremely important" factors.

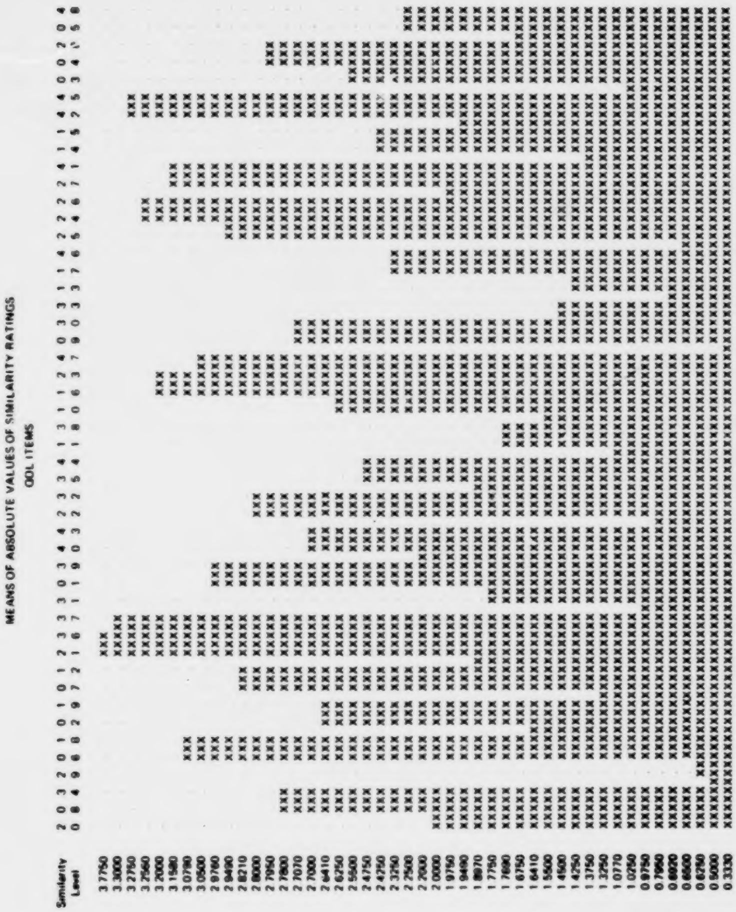

Figure 1 Computer-generated Display of Factors From Analysis of QOL Similarity Ratings

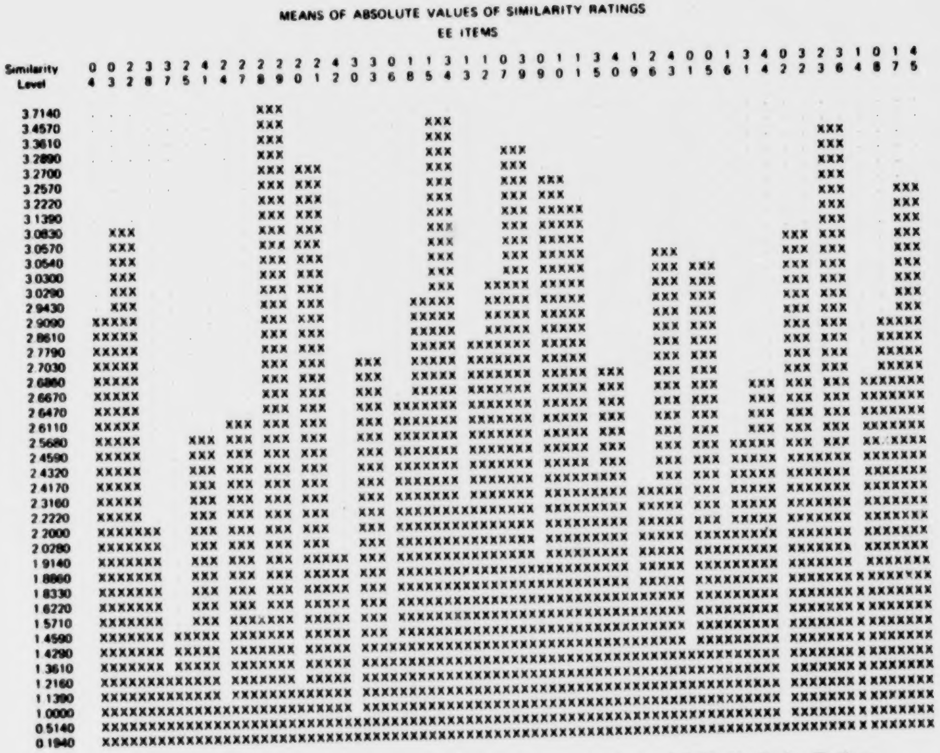

Figure 2 Computer-generated Display of Factors From Analysis of QOL Similarity Ratings

Table 3 QOL Factors

1. Novelty, change, newness, variety, surprise; boredom; humorous, amusing, witty.

2. Peace of mind, emotional stability, lack of conflict; fear, anxiety; suffering, pain; humiliation, belittlement; escape, fantasy.

3. Social acceptance, popularity; needed, feeling of being wanted; loneliness, impersonality; flattering, positive feedback, reinforcement.

4. Comfort, economic well-being; relaxation, leisure; good health.

5. Dominance, superiority; dependence, impotence, helplessness; aggression, violence, hostility; power, control, independence.

6. Challenge, stimulation; competition, competitiveness; ambition; opportunity, social mobility, luck; educational, intellectually stimulating.

7. Self-respect, self-acceptance, self-satisfaction; self-confidence, egoism; security; stability, familiarity, sense of permanence; self-knowledge, self-awareness, growth.

8. Privacy.

9. Involvement, participation; concern, altruism, consideration.

10. Love, caring, affection; communication, interpersonal understanding; friendship, companionship; honesty, sincerity, truthfulness; tolerance, acceptance of others; faith, religious awareness.

11. Achievement, accomplishment, job satisfaction; success; failure, defeat, losing; money, acquisitiveness, material greed; status, reputation, recognition, prestige.

12. Individuality; conformity; spontaneity, impulsive, uninhibited; freedom.

13. Sex, sexual satisfaction, sexual pleasure.

Table 4 Educational Factors

1. Greater creativity, expanding the imagination; loss of creativity, loss of creative thinking
2. Broader outlook, new perspectives, scope, new experiences, exposing to new activities; knowledge; curiosity, desire to learn more.
3. Social awareness, awareness of others; awareness of environment, relationship of individual with environment; cultural awareness; social issues, awareness of societal problems.
4. Career skills, job competence; specialization, narrowing of interest to own field; elitism, social status.
5. Involvement, political involvement; isolation from real world, ivory-tower syndrome; dehumanization, repressive bureaucracy.
6. Self-awareness, increased self-understanding; honesty, personal integrity.
7. Loss of idealism, general dissatisfaction; political disillusionment.
8. Self-confidence, self-reliance, independence, self-respect, self-acceptance, self-satisfaction; maturity; sexual maturity, more liberal sexual attitude.
9. Tolerance, decrease in prejudices; open-mindedness; understanding of others; narrowing of outlook, narrowing of values; liberalization of social and political views.
10. Communication skill; relating to others; social contacts, opportunity to meet a variety of people; social skills, ability to get along with others.
11. Responsibility; concern for society, fellowman; political maturity, political awareness.
12. Motivation, competitiveness, purpose in life, development of life goals.
13. Dependency, prolonged youth.
14. Ability to learn, learning to learn; reasoning abilities, ability to think, critical ability, questioning, development of a critical attitude; synthesizing ability, a sense of organic relationship.
15. Impractical education, disillusionment with educational usefulness; irrelevancy, prescribed education, educational trivia.

Table 5 Structure of Student Judgements for Session Three

QOL Group		EE Group	
Subgroup 1 Split 100 N = 20	Subgroup 2 Magnitude Estimation N = 19	Subgroup 3 Split 100 N = 19	Subgroup 4 7-pt rating scale N = 18
Part 1			
Label factors Rate self-confidence with each factor on a 1—5 pt scale Split 100 pts among the factors according to importance of each factor	Label factors Rate self-confidence with each factor on a 1—5 pt scale Rate the most important factor with 100 pts and rate the other factors proportionately	Label factors Rate self-confidence with each factor on a 1—5 pt scale Split 100 pts among the factors according to importance of each factor	Label factors Rate self-confidence with each factor on a 1—5 pt scale Rate the importance of each factor on a 1 to 7 pt scale
Part 2			
Revise ratings in light of group median and quartiles for each factor	Revise ratings in light of group median and ranges for each factor	Revise ratings in light of group median and quartiles for each factor	Revise ratings in light of group median and quartiles for each factor
Part 3			
Rate the relevance of each EE factor to each of the QOL factors on a 0 to 3 point scale	Rate the relevance of each EE factor of each of the QOL factors on a 0 to 3 point scale	Rate the relevance of each EE factor to each of the QOL factors on a 0 to 3 point scale	Rate the relevance of each EE factor to each of the QOL factors on a 0 to 3 point scale

The subjects recorded their self-confidence ratings, factor labels, and importance ratings on preprinted response sheets. They also kept a record of their labels and importance ratings which they referred to during the second and third parts of the session.

During the second part of the session, the subjects again rated the importance of the factors with the same method which they used during the first part. This time, however, they were given information about the group's previous ratings on each of the factors. The *QOL* split-100, EE split-100, and EE 7-point rating scale groups were provided with the median and the first and third quartiles for each factor, while the *QOL* magnitude-estimation group was given ranges and medians which were normalized so that the largest median was 100. The instructions explained the meanings of the statistics and requested the subjects to consider this information in revising their estimates of the relative importance of each of the factors. The subjects were given 20 minutes to complete this part of the experiment.

During the third part of the session, the *QOL* and EE groups rated the "relevance" of each of the EE factors to each of the *QOL* factors. Each group received response sheets containing spaces along the top for each of the factor labels that they had developed during the first part of the session, and a list of *QOL* factors or EE factors, respectively, down the left margin. The subjects were briefly informed about the origin of the list of factors appearing on the left margin of their worksheets. Next, the subjects were instructed to familiarize themselves with these new lists of factors. Any questions concerning the list were answered by the experimenter. Finally, the subjects were required to rate the relevance of each of the EE factors to each of the *QOL* factors on a 0- to 3-point rating scale. Relevance was defined in the instructions as either "contributing to" or "means the same thing as." The 0- to 3-point scale was tied to the following adjectives:

3 Contributes strongly (or is pretty much the same)

2 Contributes moderately

1 Contributes slightly

0 Irrelevant

The subjects were allowed 30 minutes for the completion of this part of the session.

VI *QOL*: ATTEMPTS AT COMPARATIVE STATISTICS

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SYSTEMATIC MEASUREMENT OF THE QUALITY OF URBAN LIFE, PREREQUISITE TO MANAGEMENT

Robert E. Joyce
Director, Community Analysis Bureau
City of Los Angeles, California

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Background

In June 1967, an ordinance was passed by the City Council of Los Angeles which provided for the establishment of a Community Analysis Bureau, whose continuing purpose is to prepare a comprehensive analysis of the entire city and to develop a program in accordance with the provisions of an agreement* with the Federal Government, designed to correct existing obsolescence and to prevent further inroads of the physical, economic and social forces which contribute to obsolescence.

In the course of discharging its responsibilities, CAB has performed extensive analyses utilizing the existing data sources and files available to describe and analyze the State of the City in a complete and comprehensive manner. The five major works which have been completed and published to date are relevant to the management processes of the city and represent the principal formal paper products of the bureau. These are listed in the order of publication:

- The Catalog of Information Sources of the City (in 3 volumes)
- The State of the City
- A Strategy for City Survival
- Programs for City Survival
- Monitoring and Evaluation of City Survival Programs

The last four of these works are reports that will be prepared annually on a time schedule to permit use of the data and recommendations in the city's budget cycle.

Highlights of Accomplishments

The first of these works has identified, cataloged and obtained pertinent information on the State of the City as viewed from data developed by operating departments of city and certain county organizations, such as Police, Fire,

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* HUD Grant to City of Los Angeles under provisions of Title I of the Housing Act of 1949 amended.

Streets, Planning, County Assessor, Building and Safety and the Los Angeles Regional Transportation Study. The documents describe both the reports available and the data available in machine readable form. The project has contributed in a major way to improved uniformity of data reduction processes within the city and in assisting departments in defining their data processing requirements. As a result, the city now has a continuously updated catalog and information source containing an inventory and dictionary of all data maintained in the city. At this point in time, the Community Analysis Bureau is also serving as a major factor in structuring data for various federal programs in which the city is engaged. In this regard it has provided the basis of a central data bank available to support the city's planning and decision needs, and while the quality and comprehensiveness of the data needs continual improvement, the results to date have been used in developing a comprehensive picture of the State of the City.

In the second and third works listed, a systematic inventory of the city's physical, social, and economic structure is portrayed, describing the State of the City. This report, a first of a kind in the field of City Management, describes the nature and extent of blight and obsolescence, the interrelationships and impact of blight characteristics and the requirements to counteract the undesirable conditions. In the work released by the CAB entitled "A Strategy for City Survival" the outputs of a computer technique for evaluating urban blight and its interrelationship in the city's 65 community areas are described. The data files mentioned above were used in this task. Each community area is rated utilizing the following 20 criteria:

Public Safety

- Malicious false alarms per 100 population
- Felonies per 100 population
- Engine companies per 1000 acres
- Police costs per acre
- Structural fires per 100 structures

Education

- Dropout rate
- Percent minority enrollment
- Percent voter participation
- Classroom instruction costs per average daily attendance
- Mean tenth grade reading achievement scores

Housing and Neighborhood

- Percent renter occupancy

- High school transiency rate
- Percent public housing
- Median household rent
- Percent sound housing

Income Production

- Percent white collar employment
- Percent families with two breadwinners
- Percentage of discrimination of income
- Unemployment rate
- Median Household Income

Data for 18 of the 20 criteria were obtained from the automated data files. Figure 1 illustrates how these measurement criteria may be organized in groups to measure attitudinal, societal, political attributes of the community area. The report displays the data by community area and is synthesized into a single number ranking of each area in an Overall Blight Scale. The use of a computer technique, SYMAP, is made to graphically describe the status of communities in accordance with each rating category. Figure 2 is illustrative of one of these maps, showing in this case the number of felonies per 100 population.

Manifestations	Measures of the Quality of Life in the Area			
	Public Safety	Education	Housing & Neighborhood	Income Production
Attitudinal	Malicious False Alarms per 100 pop	Dropout Rate	% Renter Occupied	% White Collar Employment
Societal	Felonies per 100 pop	% Minority Enrollment	High School Transciency Rate	% Families with two Breadwinners
Political	Engine Companies per 1000 Acres	Percent Voter Participation	Percent Public Housing	Percentage Effect of Discrimination on Income
Economic	Police Costs per Acre	Class Room Instruction Costs per Avg. Daily Attendance	Median Household Rent	Unemployment Rate
Physical	Structural Fires per 100 Structures	Mean 10th Grade Reading Achievement Scores	Percent Sound Housing	Median Household Income

Figure 1 State of the City-Measurement Categories

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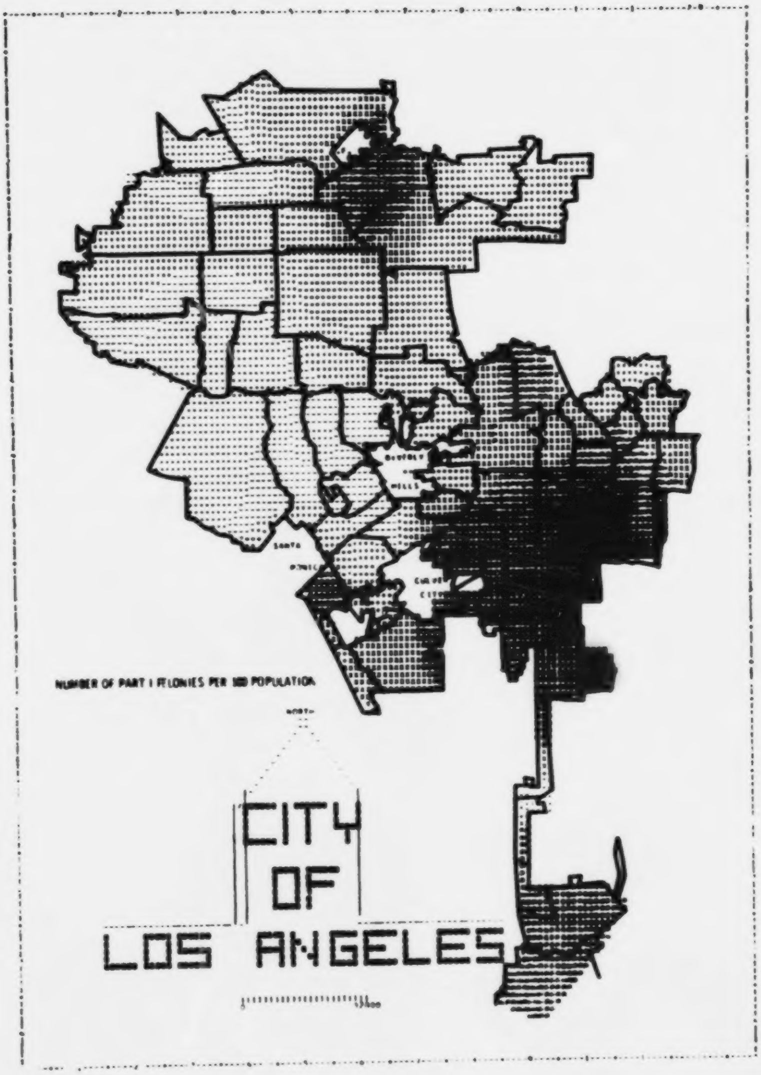
BEVERLY
HILLS
SANTA
MONICA
CULVER
CITY
NUMBER OF PART I FELONIES PER 100 POPULATION
NORTH
CITY
OF
LOS ANGELES

Figure 2 Illustrative Example of SYMAP Display

In the text that follows, additional details and descriptions of CAB's forward program will be made. However, before getting into the details of our approach, a few words concerning the overall philosophy of and the need for a continuous basis of support for our program are in order. Success in a program as fundamental as CAB's is dependent on a continuous interest, both financial as well as professional from the federal government. In a very real sense, CAB is serving as the means for defining and communicating the problems and programs of the city to its citizens *and* to the city's funding sources which are coming more and more from outside of the city proper. Therefore, let us briefly examine the broader setting in which the city must operate in defining and resolving its problems.

The Problem of Interfacing with Federal Programs–The Needed Ingredient

At the national level, an earnest and continual interest in citizen well-being exists and is manifested in the development of White House policies aimed at the delivery of goods and services to the American people to enhance the *quality of life* for all. These policies are translated into requirements coupled with budgets which are placed with appropriate federal agencies responsible for various "product lines" (HUD, HEW, etc.) Federal agencies develop major programs, coordinate enabling legislation, prepare guidelines and coordinate program implementation at the local levels, Figure 3. State, County and City governments, in miniature, follow a similar pattern in the programs they originate.

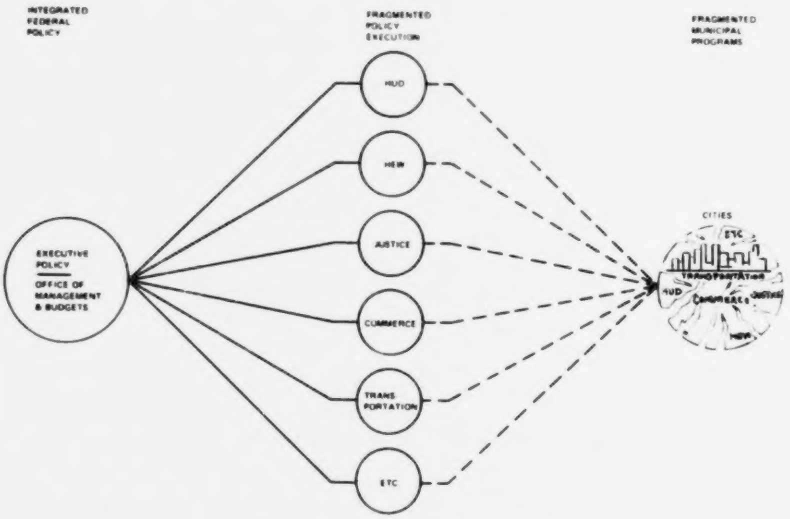
INTEGRATED FEDERAL POLICY
FRAGMENTED POLICY EXECUTION
FRAGMENTED MUNICIPAL PROGRAMS
EXECUTIVE POLICY
OFFICE OF MANAGEMENT & BUDGETS
HUD
HEW
JUSTICE
COMMERCE
TRANS PORTATION
ETC
CITIES
ETC
TRANSPORTATION
HUD
COMMERCE
JUSTICE
HEW

Figure 3 Policy Fragmentation

Thus, the city is confronted with a spectrum of programs from all sources, by city, county, state and the federal government.

These programs are intended to be a great resource pool to aid the city. However, in reality, from the city's perspective, it is a fragmented mess! The resultant degree of gaps, overlaps, and inconsistencies among the available programs is an implementation and evaluation nightmare. Municipal Government credibility continues to suffer as citizens who are the intended beneficiaries of these programs openly scoff at their fumbling execution. The cost of overhead alone for uncoordinated piecemeal approaches to curbing urban ills is astronomical.

In the early stages of our work we came to the conclusion that a vital link or capability was missing. This was a *city prepared system specification* which would set forth, in all categories, what the city needed and would depict the interrelationships of these needs, Figure 4. In CAB, we have set out to develop an "Urban System" which would give Los Angeles the capability to:

- Assess the threat facing it
- Determine requirements in meeting the threat
- Inventory and evaluate existing action programs underway
- Develop conceptual designs for filling program gaps and deficiencies
- Select promising concepts for program design
- Design an action oriented program
- Conduct action programs
- Measure and monitor performance
- Evaluate impact and suggest corrective action

Figure 5 describes the kind of capability we are in the process of developing for the City of Los Angeles.

Criteria for System Design and Development

The CAB has been in the process of developing a community analysis system which will accomplish these objectives as the principal means of discharging our legal and contractual responsibilities. The following criteria have guided our efforts.

1. The system must be a permanent, continually updated function of city government, operable by city employees.

2. The system must functionally relate to human needs (not simply to city departments.)

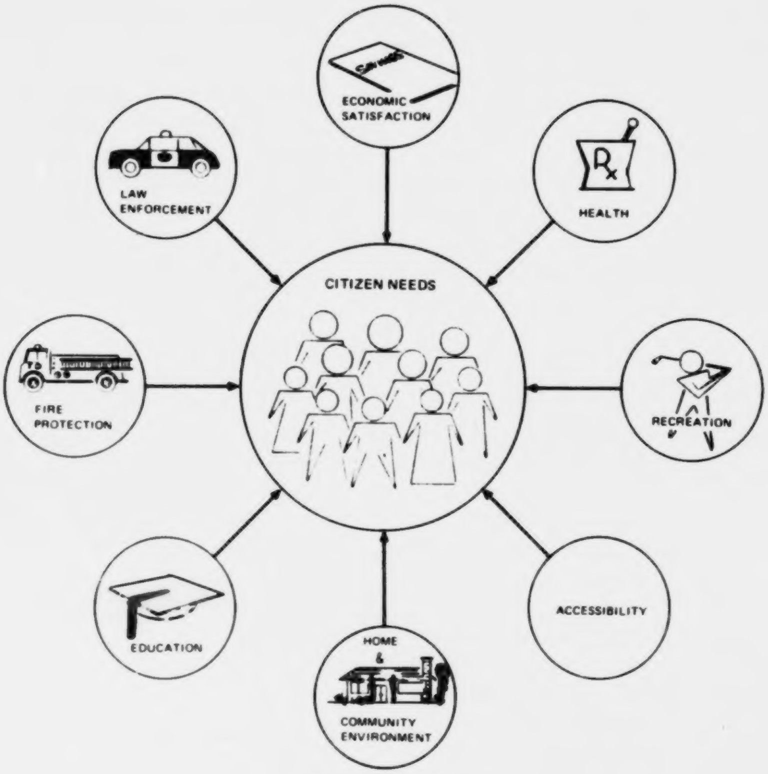
ECONOMIC SATISFACTION
LAW ENFORCEMENT
HEALTH
CITIZEN NEEDS
FIRE PROTECTION
RECREATION
EDUCATION
ACCESSIBILITY
HOME & COMMUNITY ENVIRONMENT
Rx

Figure 4 Citizen Needs

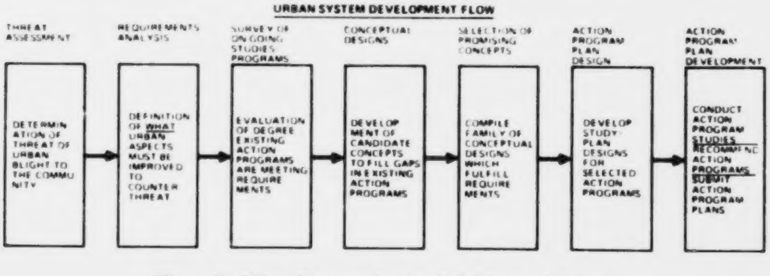
URBAN SYSTEM DEVELOPMENT FLOW
THREAT ASSESSMENT
DETERMINATION OF THREAT OF URBAN BLIGHT TO THE COMMUNITY
REQUIREMENTS ANALYSIS
DEFINITION OF WHAT URBAN ASPECTS MUST BE IMPROVED TO COUNTER THREAT
SURVEY OF ON GOING STUDIES PROGRAMS
EVALUATION OF DEGREE EXISTING ACTION PROGRAMS ARE MEETING REQUIREMENTS
CONCEPTUAL DESIGNS
DEVELOPMENT OF CANDIDATE CONCEPTS TO FILL GAPS IN EXISTING ACTION PROGRAMS
SELECTION OF PROMISING CONCEPTS
COMPILE FAMILY OF CONCEPTUAL DESIGNS WHICH FULFILL REQUIREMENTS
ACTION PROGRAM PLAN DESIGN
DEVELOP STUDY PLAN DESIGNS FOR SELECTED ACTION PROGRAMS
ACTION PROGRAM PLAN DEVELOPMENT
CONDUCT ACTION PROGRAM STUDIES
RECOMMEND ACTION PROGRAMS
SUBMIT ACTION PROGRAM PLANS

Figure 5 Urban Community Analysis System Concept

3. The system must provide local city officials and administrators with a comprehensive, continually current objective decision making and programming tool.

4. The system must provide resultant analytically-based program recommendations to be incorporated into the yearly budget cycle and must project multi-year plans and resource allocation.

5. The system must employ techniques to interpret, manipulate and evaluate data using existing, continually updated operating files as its data base.

6. The system must provide analytical input to all plans for urban development.

7. The system must have a constant monitoring, evaluation and feedback loop capacity.

8. The system must produce annual documentation definable to action agencies.

9. The system must contain a community information program to assure citizen awareness and participation in partnership with local government.

10. The system must have national applicability so as to provide instructional material to other local governments.

System Policy is set by the Board of CAB which is composed of both operating department and political representation. In this way action on the findings and recommendations is insured.

Our Approach to the Development of the Community Analysis System

The CAB has functioned essentially as a large system development project and has been managed using the tools of project management pioneered in some of our military/aerospace programs. A discussion of the major phases or steps comprising our work plan will serve two purposes. It will chronologically relate some of the activities involved and secondly it will permit some additional description of the system under development to be made. Figure 6 depicts this work program. Each of these major steps will be discussed in turn.

STEP 1 - Development of Community Analysis System Specification

The Los Angeles Community Analysis System Specification was laid out in

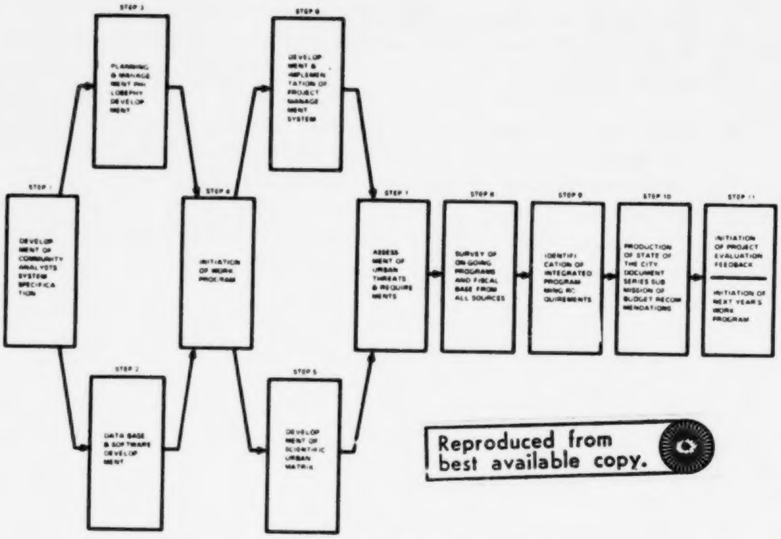
STEP 1
DEVELOPMENT OF COMMUNITY ANALYSIS SYSTEM SPECIFICATION
STEP 3
PLANNING & MANAGEMENT PHILOSOPHY DEVELOPMENT
STEP 2
DATA BASE & SOFTWARE DEVELOPMENT
STEP 4
INITIATION OF WORK PROGRAM
STEP 6
DEVELOPMENT & IMPLEMENTATION OF PROJECT MANAGEMENT SYSTEM
STEP 5
DEVELOPMENT OF SCIENTIFIC URBAN MATRIX
STEP 7
ASSESSMENT OF URBAN THREATS & REQUIREMENTS
STEP 8
SURVEY OF ON-GOING PROGRAMS AND FISCAL BASE FROM ALL SOURCES
STEP 9
IDENTIFICATION OF INTEGRATED PROGRAMMING REQUIREMENTS
STEP 10
PRODUCTION OF STATE OF THE CITY DOCUMENT SERIES SUBMISSION OF BUDGET RECOMMENDATIONS
STEP 11
INITIATION OF PROJECT EVALUATION FEEDBACK
INITIATION OF NEXT YEAR'S WORK PROGRAM

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Figure 6 Community Analysis System - Work Program

the Study Design developed in 1968. This governing document established the scope and requirements of the program to meet the following objectives:

- The development of an integrated program for conducting continuing comprehensive analysis of the entire city and the establishment of priorities of city-wide action programs to correct existing deterioration and to prevent further inroads of a physical, economic and social nature that contribute to such urban decay.

- The use of the comprehensive city analysis in the following ways:

  - Determination, measurement, examination and analysis of city problems.

  - Determination of the impact of on-going community improvement programs on the urban environment.

  - Recommendations of alternative community improvement action programs.

  - Continual monitoring and evaluation of action programs.

  - Determination of legislative changes required to prevent urban decay.

STEP 2 - Data Base and Software Development

Large amounts of data had to be assembled in order to perform the analysis and depictions required. To accomplish data processing tools designed to ease the tasks of retrieval, the Los Angeles Urban Information System was designed to accomplish this need. The structure of this system is described in Figure 7 and includes:

- Cataloging data
- Input structuring/data base
- Data processing/output (software)
- Feedback and monitoring

In the development of this system emphasis was placed on acquiring and manipulating existing operating, updated files and available computer software to relate urban blight symptoms to the characteristics of the city and its people.

STEP 3 - Planning and Management Philosophy Development

The task of developing an overall planning and management process for CAB was undertaken concurrently with the development of the Urban Information System. This activity featured two main thrusts–development of management system for management of the project, and secondly, the selection of the framework for analysis–i.e., the subject areas to be treated. The first of these thrusts has been discussed earlier and will be described in greater detail in Step 6. In the second, the CAB elected to use the subject areas found in PPBS as developed federally. These categories were deemed appropriate because they are comprehensive in coverage, people oriented, and can be readily incorporated into the Los Angeles PPB-oriented Budgeting System. The main PPB subject areas adapted are:

- Personal Safety
- Health
- Education
- Home/Community Environment
- Economic Satisfaction
- Recreation
- Accessibility

STEP 4 - Initiation of Work Program

After initial development of the Information System and Management Plan, a more definitive organization of the Community Analysis Project team evolved. Organizational assignments were made to perform major task elements and

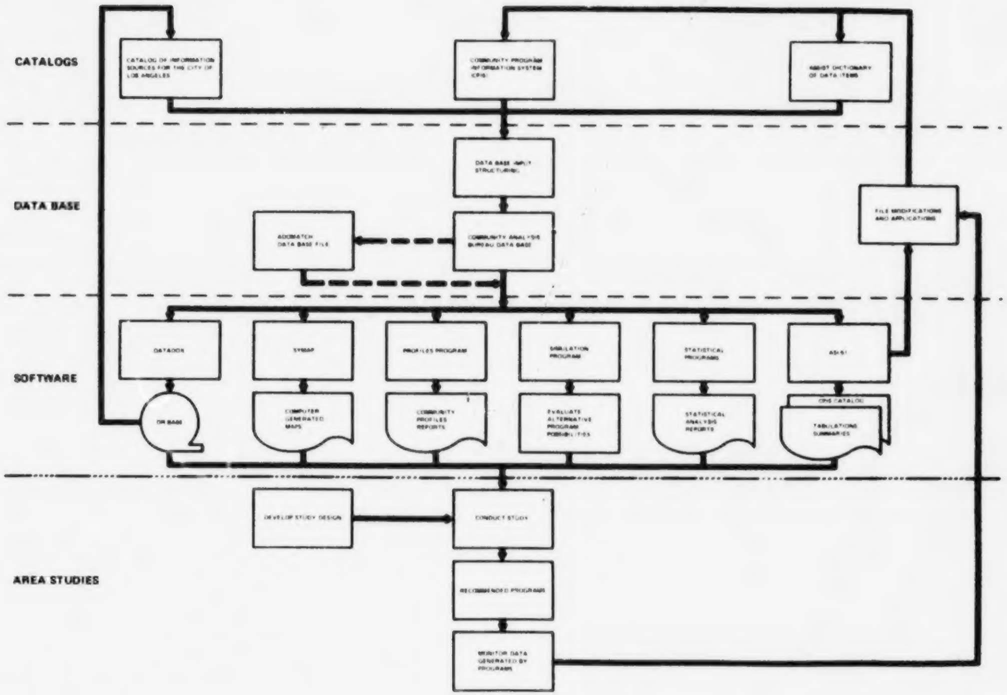
CATALOGS
DATA BASE
SOFTWARE
AREA STUDIES
CATALOG OF INFORMATION SOURCES FOR THE CITY OF LOS ANGELES
COMMUNITY PROGRAM INFORMATION SYSTEM (CPIS)
ASIST DICTIONARY OF DATA ITEMS
DATA BASE INPUT STRUCTURING
ADDMATCH DATA BASE FILE
COMMUNITY ANALYSIS BUREAU DATA BASE
FILE MODIFICATIONS AND APPLICATIONS
DATADOS
DR BASE
SYMAP
COMPUTER GENERATED MAPS
PROFILES PROGRAM
COMMUNITY PROFILES REPORTS
SIMULATION PROGRAM
EVALUATE ALTERNATIVE PROGRAM POSSIBILITIES
STATISTICAL PROGRAMS
STATISTICAL ANALYSIS REPORTS
ASIST
CPIS CATALOG
TABULATIONS SUMMARIES
DEVELOP STUDY DESIGN
CONDUCT STUDY
RECOMMENDED PROGRAMS
MONITOR DATA GENERATED BY PROGRAMS

Figure 7 Los Angeles Urban Information System - Operating Description

technical service contracts were issued to provide training and support in areas currently beyond city personnel capability.

STEP 5 - Development and the Scientific Urban Matrix

The Scientific Urban Matrix (SUM) was developed as a computer based technique to describe and evaluate urban blight and its interrelationships for Los Angeles' 65 community areas. This tool views the urban system in terms of its constituent functional subsystems, such as education, public safety, etc. These are the PPB categories described in Step 3. Each subsystem is further subdivided into its various aspects or manifestations, (physical, economic, social, political, etc.) Figure 1 showed this matrix and relationships. In our current work program we have expanded SUM to include the analysis of 40 measures as contrasted to the 20 used in our first State of the City Report. Figure 8 describes this new set of measures–the data for which comes from existing machine readable files. In the SUM system it is possible to sum up the effects by either column or row and thereby measure each aspect of each function examined. This computer-driven analysis of the Urban Data Base contains 29 files and approximately 8 million machine-readable records. The system not only addresses principal deficiencies within a given category, but examines closely the horizontal relationships across categories. For example, using SUM, we are able to assess the impact of enhancement of education on income production, housing, public safety, etc. By use of SUM we are able to measure each of the Los Angeles 65 communities, integrate their problem ratings, and rank them against city-wide norms.

STEP 6 - Development and Implementation of Project Management System

The primary function of the Community Analysis Project Management System is to describe the game, its players, the rules and the current score. Specifically, the system is comprised of the following elements:

- A management information center for community analysis (Figure 9)
- A comprehensive statement of the mission of the Community Analysis System.
- A definition of project task elements and their relationships in the form of a project breakdown structure.
- Organization structures for each program participant.
- Assignments of program responsibility to participants.
- Definition of required documentation.

Manifestations or Aspects	Measures of the Quality of Life in the Area							
	Accessibility	Law Enforcement	Fire Protection	Health Care	Recreation	Education	Housing and Neighborhood	Income Production
Attitudinal	Modal Preference of Transportation	Juvenile Probations per pop. 20-21	Malicious False Alarms	Inoculable Diseases (under 13)	Vandalism $ per Park Acre	High School Dropout Rates	Elementary School Enrollment	% White Collar Employment
Societal	Traffic Arrests/Total Street Miles	Juvenile Dependencies per pop. age 20-21	Arsons per 100 pop.	Suicides per 100,000 pop.	% pop. for Different Age Groups	Largest Ethnic percentage. % Non-white Enrollment	Elementary School Transiency Rates	% Household with Wives Working
Political	Deficient Select System/Total Select System Streets	Total Arrests per 100 pop.	Fire Engine Companies per 1000 pop.	% Public Hospital Care	5-yr.Proposed Cap. Improv. Program for Parks and Recreation	Voter Participation Rates	Non-residential Uses on Residential Parcels	% Children 4-5 Yrs.Age on Welfare
Economic	% By-passed Employment Due to Lack of Transportation	Losses Due to Burglary and Robbery	No. of Fires Greater than $1000. Loss	Deaths in 25-44 Age Group	Private Recreation Investment per 100 pop.	% of People 25+ Yrs Completed College	Median Imputed Rent per Median Income	Unemployment Rate
Physical	Median Work Trip Time by Private Transportation.	Part I Felonies per 100 pop.	Structural Fires per 100 Structures	Infant Mortality Rate	No. of Types of Facilities	Median 6th Grade Reading Achievement	% Sound Housing. % Lacking Facilities	No. Householders under $1000. per Capita Income

Figure 8 Expanded Set of Measures of Quality of Life

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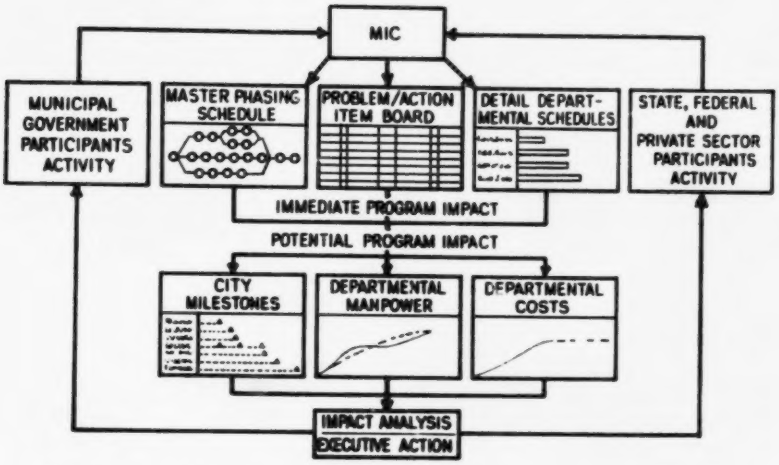
MIC
MUNICIPAL GOVERNMENT PARTICIPANTS ACTIVITY
MASTER PHASING SCHEDULE
PROBLEM/ACTION ITEM BOARD
DETAIL DEPARTMENTAL SCHEDULES
STATE, FEDERAL AND PRIVATE SECTOR PARTICIPANTS ACTIVITY
IMMEDIATE PROGRAM IMPACT
POTENTIAL PROGRAM IMPACT
CITY MILESTONES
DEPARTMENTAL MANPOWER
DEPARTMENTAL COSTS
IMPACT ANALYSIS
EXECUTIVE ACTION

Figure 9 Comminity Analysis Management Information Center (MIC) Operations

- Development of program milestones and master schedule.
- Resource management displays.
- Continual monitoring, control and necessary executive re-direction of work effort.

The function of the Community Analysis Program Management System is to provide total program visibility to all participants at all times in order to assess progress and resolve problems.

STEP 7 - Assessment of Urban Threats and Requirements

The SUM system previously described is used to determine and verify the threats to urban survival in terms of the 20, now 40 measures of the *quality of life* used. The results of this effort are documented annually in the following two volumes–I "The State of the City" and II "The Strategy for Urban Survival". The primary objective of these two documents, part of an annual quartet, is to establish a description of the "as is" condition of the various areas of the city and to provide a determination of the types of remedial actions to be investigated and programmed.

STEP 8 - Survey of On-Going Programs and Fiscal Base for Renewal from All Sources

This task involves an investigation and structuring of programs from all sources on-going within the city and those being conducted elsewhere which may have local relevance. For example, as a result of these analyses we have been able to make a determination of total government spending in the City of Los Angeles from all sources, broken down by PPBS Categories. Figure 10 illustrates this breakout.

These programs and their benefits are matched against the needs assessed in Step 7 and form a basis for determining new programming needs. The existing revenue and expenditure base, from all sources, is identified and related to programming requirements. This fiscal base enables the municipality to develop financial resource strategies to assign and match local, state and federal funds to priority needs.

STEP 9 - Identification of Integrated Programming Requirements

Based upon findings from the previous steps, a programming package was developed to translate comprehensive requirements into relevant on-going measures and new concepts to integrate programming applications. This package, Volume III, "Programs for City Survival", details on-going action programs assigned to correct deficient urban conditions and develops new concepts to address potential gaps in renewal programming. In all, we inventoried 118 programs in this exercise. Figure 11 illustrates the breakout by PPBS category. The accomplishment of this task establishes, against a fiscal base, the proposed family of action programs to be undertaken during the succeeding year.

STEP 10 - Production of State of the City Document Series–Submission of Budget Recommendations

This task represents the culmination of the production portion of the annual work program. It entails the production and distribution of the three documents previously described, as well as the development and dissemination of the plan and calibrator for the next year's work program. Volume IV, "Monitoring and Evaluation of City Survival Programs" provides a procedure to appraise the operational effectiveness of remedial action programs currently being implemented, and thereby guides the city to more effectively allocate scarce resources to the solution of urban threats. This documentation, including fiscal information in Volume III, "Programs for City Survival", is submitted for inclusion in the city budgeting system.

GROSS^1 TOTAL GOVERNMENTAL SPENDING
IN THE CITY OF LOS ANGELES
FISCAL YEAR 1969 (IN THOUSANDS OF DOLLARS)

PPBS CATEGORY^2	City		County^3		Special District		State^3		Federal		TOTAL	%
	$	%	$	%	$	%	$	%	$	%		
HOME AND COMMUNITY ENVIRONMENT	567,709	53.4	17,726	3.7			31,982	5.5	34,325	2.2	651,742	15.2
COMMUNITY SAFETY	179,058	16.8	51,689	10.7			23,878	4.2	490,944	30.5	745,568	17.4
TRANSPORTATION AND COMMUNICATION	172,032	16.2	0	0	(SCRTD) 51,728		35,773	6.2	128,245	8.0	387,778	9.0
CULTURAL RECREATION EDUCATION	32,154	3.0	14,547	3.0	(L.A. UNIFIED SCHOOL DIS.) 503,831		283,327	48.8	141,402	8.9	975,261	22.7
HUMAN RESC. ECON. ASS'T. & DEVELOPM'T	703	.1	316,231	65.1			160,330	27.6	565,201	35.2	1,042,465	24.4
GEN. ADMIN. & UNALLOCATED	111,385	10.5	84,840	17.5			44,930	7.7	244,345	15.2	485,500	11.3
TOTAL	1,063,040	100.0%	485,033	100.0%	555,559	100.0%	580,220	100.0%	1,604,462	100.0%	4,288,314	100.0%

Source: Various government budgets as apportioned by the Community Analysis Bureau into PPBS categories.

Figure 10 Gross Governmental Spending in the City of Los Angeles by PPB Category

Figure 11 Summary of Inventory of Ongoing Programs in Los Angeles

	Program Status			
PPBS Program Category	Functioning	Potential	New	Total
Personal Safety	5	7	4	16
Recreation	5	2	2	9
Satisfactory Shelter	13	3		16
Education - Pre School	5	5		10
In School	6		4	10
Post School	4		2	6
Accessibility - Traffic Congestion	5	3		8
Personal Immobility	8	4		12
Health	13	4		17
Economic Satisfaction	5	6	3	14
Total	69	34	15	118

STEP 11 - Initiation of Project Evaluation Feedback/Initiation of Next Year's Work Program

Subsequent to municipal approval, program and proposal coordination with affected city departments and executive and legislative branches is performed. In addition, necessary county, state and federal agency liaison is accomplished to bring all supportive actions to focus on selected programs and priorities. Once underway, projects are subjected to techniques of surveillance and evaluation described in Volume IV, "Monitoring and Evaluation of City Survival Programs". In the establishment of criteria for the next year's work program is found the framework for the Project Management System to guide all community Analysis activities.

SUMMARY

In summary, the eleven steps, outlined above, embodied in the systems framework, have been successfully applied in Los Angeles to evaluate and plan towards the comprehensive solution of its urban problem specification. This is perhaps the first successful application of these principles in America. This methodology thus holds promise for all cities, large or small, facing today's urban crisis.

DISCUSSION FOLLOWING MR. JOYCE'S PRESENTATION

Q: To what extent in what you have done so far have you found that the source problems can be identified or be related one-to-one to federal programs?

A. *Joyce*: We are in the process of setting up what we call a Community Program Information System. This will take all the current community programs and set them up on the chart showing the requirements to be met. This will identify those programs that most completely meet requirements as well, thus, we're going to look at it as far as writing applications in various places.

Q: Do you yet have a feel for the relevance of federal programs to given problems perceived in the city?

A. *Joyce*: No, we are just in the process of doing that now. That system is just being set up so that federal programs can be interfaced with the matrix. One might expect to find big gaps in the programming which leads us to start trying to fill those gaps. We also may find some things that are completely irrelevant that have been going on for a long time.

Q: Can what you are doing and have learned be readily transferred to another city or state?

A. *Joyce*: Technically, everything we are doing can be transferred. However, the political and social situation that will be encountered in each new jurisdiction will have to be assessed and made part of the program. To install any system requires a guiding hand which must be included in the plan for the transfer.

A STUDY IN
COMPARATIVE URBAN INDICATORS:
Conditions in 18 Large Metropolitan Areas

Michael J. Flax

1206-4

An expanded revision of "The *Quality of Life* in Metropolitan Washington, (D. C.): Some Statistical Benchmarks," 136-1, March 1970.

THE URBAN INSTITUTE
WASHINGTON, D. C.

II. USES OF THIS REPORT

In this paper we are trying to reach many potential users of urban indicators, such as government administrators, planners, businessmen, labor leaders, journalists, community action groups, and concerned citizens in general. We believe that these groups have a real need for a simple set of urban quality measures that will help reduce the role of hearsay, intuition, and isolated bits of personal experience as the major criteria for citizen decision making. To illustrate what can be done, we have attempted here to collect diverse data from widely scattered sources, to screen them, to integrate them, and to present them in a form that few in the potential non-technical user groups are themselves likely to do.

We recognize that this report deals with complex subject matter and that non-professional readers may misinterpret and misuse the data we present. We have, therefore, documented the deficiencies of the data we used. The primary function of the simplified indicators presented here is to offer a method of better communicating the state of urban conditions to a wide audience. In any of these functional areas more detailed information than is provided by these simple indicators is desirable for evaluation or design of governmental programs. The possibility of an indefinite continuation of the present lack of understandable indicators relative to many urban issues is an even more intolerable prospect than is the possible misinterpretation of the limited imperfect data now available.

One way, we feel, to get better data is to spotlight, rather than to conceal, the highly imperfect data now available. Our earlier report, for example, led to numerous suggestions for changes and improvements in our indicator set, some of which we have been able to incorporate into this revision. We hope that this report will also encourage other researchers and administrators to suggest and develop conceptually better and statistically more accurate indicators to replace some of the crude quality measures we have used in this report. An important consideration is that in many cases the basic raw statistics are already available from which to develop better indicators. In other words, with minimum additional cost many improved indicators could be developed if there is the will or public pressure to do so. It is intolerable, for instance, that in a field as important as public education, (and one in which so many statistics are collected at the individual student and individual school level), that there are not better data consolidations which would permit more meaningful intercity comparisons of student achievement.

The city/suburban tabulations developed in this report are presented not only for their substantive content. They are also meant to furnish an illustration of how simple manipulation and innovative comparative presentation of existing data can sometimes facilitate improved comprehension and insight.

This report has been limited principally to data series available on a yearly basis so that recent changes could be measured. A large amount of detailed Census data will be available shortly. We suggest that innovative and comparative presentation techniques similar to those demonstrated in this report could aid those analyzing Census data in effectively presenting their results to a large audience.

Specific Suggestions for Using this Report

The indicators presented here are an approximate attempt to quantify some aspects of a wide variety of concerns. Some suggestions as to how they might be used are listed below:

1. Exhibits similar to those shown for metropolitan Washington, can be prepared for any of the other 17 metropolitan areas, e.g., exhibits could be prepared for Pittsburgh or Buffalo.

2. Metropolitan areas or cities not included in this report could compare their levels or rates of change for specific indicators with the values provided, e.g., infant mortality or reported robbery data for Atlanta could be compared with other large metropolitan areas or cities.

3. The indicators can be used as a basis for comparison with other available data.

    a. additional data in specific functional categories could be used to supplement that presented here (as was done in Unemployment and Housing in this paper). If presented in a comparable format, additional data on these 18 metropolitan areas could provide a broader picture, e.g., burglary and violent crime rates could be added to the data on public order.

    b. additional data on different functional categories could be displayed in this format for these 18 metropolitan areas, e.g., tax effort, population growth, etc.

4. The metropolitan area data could serve as a comparative reference for all sorts of further breakdowns (the city/suburban technique used in this paper is one example). The same could be done for population groups, e.g., by race or income level, or geographical areas, e.g., census tracts.

5. Surprising variations in the data might be detected by inspection or simple correlation. Further study might explain some of these variations, and in some cases might suggest corrective action.

III. QUALITY CATEGORIES AND SELECTED INDICATORS

Five general ground-rules governed our selection of quality categories and indicator measures included in this study:

1. We wanted to include a wide cross-section of urban quality considerations, some relatively objective and some more subjective in nature. For example, we used income and unemployment as well as community concern and citizen participation.

2. We wanted to include quality considerations for which there is a general consensus relative to their importance and desirable direction of change. For instance, there is wide-spread concern and interest regarding the amount of criminal behavior, the severity of air pollution and the state of the health of our population. Furthermore, few would favor rising levels of reported crime, air pollution or infant deaths.

3. Initially, to keep this study as simple as possible, we selected only one indicator for each quality category. In some cases we could have obtained many measures; for instance, in health as many as 60 indicators. In this revision we generally continued this policy, since the addition of many multiple measures would have greatly complicated the presentation of findings. However, wherever a new measure was adopted, the data on the measure previously used are presented and in two cases we presented other data in Appendix A (participation rates relating to unemployment data, and recent Census data related to housing) to supplement our yearly series.

4. In most cases the availability of data influenced our selection. For instance, we could obtain no recent data for leisure opportunities or criminal justice. As a ground-rule, we initially required data for two recent years to obtain some measure of comparative rates of change, but for this revision the data available concerning narcotics addiction did not permit measurement of changes in this category.

5. Wherever possible we sought "output" oriented measures of urban quality, i.e., to measure what urban conditions actually are rather than how much money communities are spending or in what activities they are engaging to improve quality.

Table 1 lists the quality categories and specific indicators used in the initial and revised version of this report, as well as the latest year for which the data are available.

In the course of revising this report the specific indicators used were changed in four quality categories. The rationale behind these changes is briefly discussed below.[1]

1. **EDUCATIONAL ATTAINMENT OF THE ADULT POPULATION** - Within the past year, the Census Bureau began issuing yearly data[2] on the educational attainment of adults in large metropolitan areas. At the same time decreasing draft quotas and change in the administration of the draft introduced uncertainties which made the use of yearly selective service test score data more questionable. It should be emphasized that in this case switching indicators involves a conceptual change in our education indicator. Previously, we were measuring (in a crude fashion) the education imparted to a certain segment of a metropolitan area's youth. In this report we are measuring the formal educational attainment of the adult population which was not necessarily attained in the metropolitan area of current residence.

2. **TRANSPORTATION** - We were unable to obtain data for a transportation indicator in our initial report. Data availability led us to attempt to estimate a related quality–traffic safety, by measuring the ratio of traffic deaths to population in each metropolitan area. Further thought and discussion suggested that higher traffic deaths may in fact be associated with higher speed vehicular traffic, and therefore may indicate less traffic congestion and more convenient transportation. This ambiguity led us to discard traffic deaths as an unsuitable indicator.

   Further search for a transportation indicator revealed that the Bureau of Labor Statistics publishes biennial family budgets designed to compare the costs of similar standards of living in the 39 largest U.S. metropolitan areas. The transportation component of these budgets is a measure of what it costs families with similar life styles to provide the transportation they need. Thus this is a measure of only

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[1] Gail Finsterbusch has expanded this discussion in her paper on Conceptual and Methodological issues (*op. cit.* footnote b, page v).

[2] These data are obtained from the Current Population Survey, a monthly 50,000 sample nationwide household survey, conducted by the Census Bureau. Further details on the data used for each of the indicators in this report can be found in Appendix A.

Table 1 Quality Categories and Selected Indicators

QUALITY CATEGORIES	Latest Year Data	INDICATORS USED
Unemployment	1970	% of labor force unemployed[a]
Poverty	1970	% of households with incomes less than $3,000 per year
Income	1969	*Per capita money income adjusted for cost of living differences
Housing	1969	Cost of housing a moderate income family of four
Health	1969	Infant (under 1 year) deaths per 1,000 live births[a]
Mental Health	1969	Reported suicides per 100,000 pop.[a]
Public Order	1970	Reported robberies per 100,000 pop.[a]
Racial Equality	1970	Ratio between nonwhite and white unemployment rates
Community Concern	1970	*Per capita contributions to United Fund appeals
Citizen Participation[b]	1968	*% of voting age population that voted in recent presidential elections
REVISED INDICATORS[c]		
Educational Attainment[d]	1969	*Median school years completed by adults
Transportation[e]	1969	Cost of transportation for a moderate income family of four
Air Quality[f]	1969	Average yearly concentrations of three air pollution components, and change in the concentration of suspended particulates
Social Disintegration[g]	1969	Estimates of number of narcotics addicts per 10,000 population

*An increase in the absolute value of these indicators is assumed to represent an improvement in the quality of life. The reverse is true of all the others.

a/Data is also provided on central city, suburban, and city/suburban ratio levels and their rates of change. b/This indicator did not require revision. c/Data on previous indicator used are presented in Appendix A. d/Selective Service Mental Test rejection rate was used previously. e/Deaths from auto accidents per 100,000 population (an indicator of traffic safety) was used previously. f/A composite index of pollutants was used previously. g/A new method of estimating addiction rates is used.

one aspect of transportation–its money cost–not the cost in time, or inconvenience, for example.

Also, it is *not* a measure of the quality, speed, comfort or convenience of transportation in these areas. As a matter of fact, a low total cost for transportation in a given city may be caused by the inconvenience and high costs of specific transportation services. Despite these conceptual difficulties, it remains the only comparable data available and it does measure one component of the transportation picture. As such we have used it as *an* indicator of transportation.

3. **AIR QUALITY** - The Environmental Protection Agency (EPA) no longer computes the composite index used in the initial report. However, data on three air pollution components are available for the central cities of the metropolitan areas considered here (the best available estimate of metropolitan area conditions), and the EPA has issued air quality standards. We investigated a proposed weighted pollution index (referred to in Appendix A) and decided not to use it at this time due to data acquisition, conceptual, and presentation difficulties. Instead we ranked the central cities of the metropolitan areas with respect to their average yearly concentrations of the three pollutants and referenced each to the applicable EPA standard. We also calculated changes in the concentrations of suspended particulates during recent years as an indicator of changing air quality conditions.

4. **SOCIAL DISINTEGRATION** - Here the problem was that our previous data source, the narcotics addict register in each city, was seen not to be a consistent measure of the actual number of addicts. Investigation revealed that the Bureau of Narcotics and Dangerous Drugs was beginning to use a more sophisticated method of estimating the actual addict population from the available data in each city. A description and caveats concerning this technique are supplied in Appendix A. At this time, data are available for only seven cities for a single year (1969).

IV. MAJOR CAVEATS

1. We believe that urban indicators have the potential of becoming a useful tool that can aid urban planning and administrative decision-making by providing a more quantitative picture of many complex functional areas. However, in this, as in our earlier paper, our objective is more limited. We aim only to *describe* certain recent urban conditions and provide some quantitative estimate of how they have been *changing*. We make no attempt in this report to explain

why these conditions exist, to suggest how these conditions might be improved, or to assess the merits of particular action programs in major cities.

2. We caution the reader about reading into our measure of urban conditions more than we have specified. At best, we have measured representative qualities of urban life. In each of the fourteen quality categories we have studied, we have given "an" indicator of urban life. In no case do we contend that our measure is a surrogate of the total quality in the category cited. We recognize that conceptual as well as data limitations have resulted in our measuring some aspects of the "standard of living," i.e., citizen income, crime, etc., rather than the *quality of life*, which would require at least some measurements of numerous "amenities" and of how people perceive the conditions under which they live.

3. The experts we consulted in the course of obtaining our data were unanimous in cautioning us from reading too much into the crude data available. Although we state caveats applicable to each data series in Appendix A, and we rounded off the data for each measure to a number of decimal places consistent with their accuracy and the range of values displayed, we feel obliged to reemphasize the crudeness of the available data.

4. Because we have attempted to make our report comprehensible to a broader class of readers than most papers on social indicators, we have expended considerable time and effort toward intelligent simplification of the data in order to communicate effectively. In all cases we explicitly documented the weaknesses of the data we used. It is also true, that more information than is contained in these simple indicators is desirable for the evaluation and design of governmental programs.

5. There is disagreement as to the proper "scale" on which urban indicators should be developed. We have chosen the "metropolitan area" as the primary basis of analysis, partly because more data were available to us on that basis. One shortcoming of this basis is that it may conceal some great disparities between the central city and suburbs and other intra-metropolitan divisions. Where data were available (for 5 of our indicators) we computed and presented figures highlighting central city/suburban differences. Further disaggregation of these data (for different areas within cities) seems desirable, and we intend to continue our work in this area.

6. An increase in the numerical value of most of the measures used represents an unfavorable trend. We attempted to use familiar measures in deriving our indicators, and the most applicable data series measure unfavorable conditions, e.g., crime, pollution, etc. For the four measures (and the categories for which they are employed as an indicator) listed below, however, an increase in numerical value is considered favorable.

- per capita income (income)
- per capita United Fund contributions (community concern)
- percent population voting (citizen participation)
- median school years completed (educational attainment)

7. We have used the technique of ranking cities as one of our methods of presentation. This technique is useful in many ways but ranks are only an approximate measure of the degree of differences among cities. To mitigate this difficulty we have presented data along with the rankings wherever possible. Conditions considered more favorable were assigned lower numerical rankings, (e.g., the metropolitan area with the lowest reported robbery rate was ranked #1) and the tables were footnoted to make this assignment explicit in each case.

8. We have used annual percentage changes as a measure of changing conditions. This form of measurement tends to make the same absolute change appear larger in areas that have the lowest measured levels (e.g., a given increase in the unemployment rate produces a larger rate of change in areas with lower unemployment rate levels). In order to obtain a more balanced appraisal of changing conditions one should examine the absolute numerical size of the change in what is being measured (e.g., the numerical change in the unemployment figures) and the numerical change in the rate itself (e.g., the amount by which the unemployment rate changes), as well as the percentage change data presented in this report.

9. The one-year time span used to study the rate of change in the initial version of this paper was usually too short a period to detect significant trends. In this revision we have widened this time span to include five-year annual average rates of change (wherever the data were available), while continuing to present one-year change data in Appendix A. Data adequate for measuring change in the rate of narcotics addiction (social disintegration) were not available.

10. Although we have used some form of objectively verifiable data for all the measures in this report, we recognize that the manner in which people perceive the conditions around them is also a legitimate aspect of the ***quality of life***. We hope to investigate means of combining measures of citizens' perceptions with measures of existing conditions in order to provide a more comprehensive and valid description of conditions in numerous functional categories for different geographical areas.

11. In the future, the basic technique demonstrated here (e.g., comparing the conditions and rates of change of cities with one another and displaying the results in a simple manner) could be combined with available computer software to allow the user a choice of much more sophisticated yet readily describable statistical treatment of the data (such as simple correlation) together with a wide variety of output formats (both tabular and map-like presentations). This combination could enable a decision-maker to specify and conveniently obtain, in a form which he could understand, some of the information which would assist him in his tasks.

APPENDIX C

SUMMARY TABLES FOR ALL DATA

Three summary tables are presented in this appendix.

1. Summary Ranking Table for the 18 Metropolitan Areas -

   The rankings using the most recent metropolitan area data are presented.

2. Summary Ranking Table for the City/Suburban Analyses -

   Relative standings of metropolitan areas, central cities and suburban areas are tabulated.

3. Metropolitan Summary Table -

   Symbols representing direction of recent progress, latest standing and comparative rates of change are tabulated.

Table C-1 How the 18 Metropoliatan Areas Rank: A Summary[8]

Metropolitan Area	Unemployment	Poverty	Income Level	Housing	Health	Mental Health	Public Order	Racial Equality[c]	Community Concern	Citizen Partici.	Educational Attainment	Transportation	Air Quality[d]			Social[e] Disintegration	Metro. Area
	% Unemployed (1970)[b]	% Low Income Households (1970)[b]	Adj. Per Capita Income (1969)[b]	Cost for Moderate Income Family (1969)[b]	Infant Mortality Rate (1968)[b]	Reported Suicide Rate(1968)[b]	Reported Robbery Rate(1970)[b]	Nonwhite/ White Unemp. Ratio (1970)[b]	Per Capita United Funds Contrib.(1970)[b]	Eligible Vote for Pres.(1968)[b]	Med. School Years of Adults(1969)[b]	Cost for Moderate Income Family (1969)[b]	Levels of 3 Pollutants (1969)[b] Part.	SO_2	NO_2	Estimates of Narcotics Addiction(1969)[b]	
New York	9	9*	6	17	9	1	18	1	18	14*	9*	1	10	18	4	7	N.Y.
L.A./Long Beach	18	15	3	10	2*	17	11	3	17	11*	3*	7	8	10	18	3	L.A/L.B.
Chicago	2	5*	5	13	[illegible]	3	14	6	15	2*	7*	13	16	17	5	1	Chi.
Philadelphia	7*	9*	14	9	17	13	6	9	10	8	13*	2	15	13	1	f	Phila.
Detroit	17	3	1	5	12	15	17	8	7	5*	13*	8	14	9	16	f	Detroit
Boston	4	1	17	18	6	10	3	f	12	2*	6	15	5*	16*	6	4	Boston
S.F./Oakland	16	17*	2	14	2*	18	13	2	13	7	2	16	1	4	10	5	S.F/Okl.
WASHINGTON	1	2	8	11	5	7	15	7	16	18	1	10	3*	7*	3	6	D.C.
Pittsburgh	14*	12	13	3	11	11	5	5	2	2*	13*	3	17	16	15	f	Pitts.
St. Louis	10*	13	12	8	10	6	9	11	6	11*	17	14	18	14*	17	2	St. L.
Cleveland	12*	7	9	15	8	16	10	12	1	9	9*	6	13	12	13	f	Cleve.
Baltimore	5*	11	16	4	15	14	16	4	14	14*	18	9	11*	11	11*	f	Balt.
Houston	5*	17*	11	1	16	12	12	10	11	16*	9*	17	5*	2*	14	f	Houston
Minn./St.Paul	14*	4	6	6	1	5	7	f	5	1	3*	11	2	7*	7	f	M./St.P.
Dallas	3	16	7	2	14	6	8	f	9	16*	3*	4*	3*	1	6	f	Dallas
Cincinnati	7*	14	10	7	7	9	2	f	3	11*	13*	12	9	6	11*	f	Cinci.
Milwaukee	10*	5*	15	16	4	8	1	f	8	5*	7*	4*	11*	5	9	f	Mlwk.
Buffalo	12*	8	18	12	13	2	4	f	4	10	9*	18	5*	2*	2	f	Buffalo

a/ The lowest rankings are assigned to the most favorable conditions. More detailed data for each quality category are provided in the exhibits of Section V or Appendix A.
b/ Latest year available.
c/ Data available for only 12 metropolitan areas.
d/ Pollutants are: Particulate Matter, Sulfur Dioxide and Nitrogen Dioxide.
e/ Data available for only seven central cities.
f/ No data available.
* Tie ranking (the lowest rank in the tie is listed). For example, B[illegible]more and Houston are tied for [illegible] ranks 5-6 in [illegible] unemployed and are both listed "5*" in this table.

Table C-2 Metropolitan, City and Suburban Rankings: A Summary Relative Standings for the Latest Year

Metropolitan Area	Unemployment			Poverty			Health			Mental Health			Public Order			Metro. Area
	% Unemployed^b (1969)^c			% Low Income Households (1969)^c			Infant Mortality Rate (1967)^c			Reported Suicide Rate(1967)^c			Reported Robbery Rate(1969)^c			
	Met.	Cy.	Sub.	Met.	Cy.	Sub.	Met.	Cy.	Sub.	Met.	Cy.	Sub.	Met.	Cy.	Sub.	
New York	9	7	7	11	7	9	12*	6	12	2	1	4	18	13	13	N.Y.
L.A./Long Beach	14	13	13*	16	12	15	4	3	8	17	17	17	10	7	18	L.A./L.B.
Chicago	6	6	8	5*	4	5	17	15	13	4	4	8	13	11	12	Chicago
Philadelphia	5	8	5	10	10	11	18	18	15	8	7	13	4	4	11	Phila.
Detroit	12	14	11	3	1*	4	12*	14	7	14	9	16	16	17	15	Detroit
Boston	d	d	d	1	16	1	2	9	5	7	3	11	6	9	8	Boston
S.F./Oakland	13	9	13*	18	14	16	1	2	6	13	18	18	14	15	17	S.F./Okl.
WASHINGTON	4	5	4	2	1*	6	7	13	4	5	5	9	17	18	16	D.C.
Pittsburgh	d	d	d	12	15	14	9	16	9	6	6	10	5	10	4	Pitts.
St. Louis	11	11	10	13	18	12	16	17	17	13	14	14	9	14	14	St.Louis
Cleveland	7	12	3	7	9	7	8	10	3	15	12	15	12	12	7	Cleve.
Baltimore	10	10	8	8	13	3	14	12	11	3	8	3	15	16	10	Balti.
Houston	8	4	12	17	8	18	10	5	10	16	16	2	11	8	2	Houston
Minn./St.Paul	1	3	1	4	3	2	3	4	2	9	13	6	7	6	3	M./St.P.
Dallas	2	2	2	15	6	17	15	7	18	10	11	5	8	5	5	Dallas
Cincinnati	c	c	c	14	17	13	6	1	16	12	15	12	2	2	6	Cinci.
Milwaukee	3	1	6	5*	1*	8	5	8	1	11	10	7	1	1	1	Mlwk.
Buffalo	d	d	d	9	11	10	11	11	14	1	2	1	3	3	9	Buffalo

a/These are rankings, with the lowest numbers assigned to the most favorable conditions. More detailed data are provided in the exhibits of Section V for each quality category. b/Data available for 14 areas only. c/Latest year data available.. d/Data not available.

* Tie ranking (the lowest rank in the tie is listed).

Explanatory Notes For Summary Table C-3

The table below has been prepared to provide a quick summary of the quality measures used for all the metropolitan areas studied.

CODE USED IN TABLE

Each metropolitan area has a three character code with respect to each quality category.

(1) The first character indicates the Direction of Change comparing the recent annual average rate of change with a zero baseline.

(+) Conditions Improved
(-) Conditions Worsened
(0) Conditions Unchanged*

(2) The second character indicates the Latest Level of quality of the particular metropolitan area with respect to the average (mean) level of all 18 metropolitan areas.

(+) Better than Average
(-) Worse than Average
(0) About Average*

(3) The third character indicates the particular metropolitan area's average annual Rate of Change with respect to the average (mean) change of the 18 metropolitan areas.

(+) Rate of Change Favorable
(-) Rate of Change Unfavorable
(0) Rate of Change Average*

FOR EXAMPLE: +0- means that the metropolitan area is improving, its latest level of quality is about average, and its rate of change is less favorable than average.

* Conditions are defined as "unchanged" or "average" if the particular metropolitan area's performance varied by less than ± 10 per cent of the range of values of the other metropolitan areas.

Table C-3 18 Metropolitan Area Indicators for 14 Quality Categories*

Metropolitan Area	Unemployment	Poverty	Income Level	Housing	Health	Mental Health	Public Order	Racial Equality[b]	Community Concern	Citizen Particip.	Educational Attainment	Transportation	Air Quality		Social Disintegration[d]	Metro. Area
	% Unemployed (1970)[a]	% Low Income Households (1970)[a]	Adj. Per Capita Income (1969)[a]	Cost for Moderate Income Family (1969)[e]	Infant Mortality Rate (1969)[a]	Reported Suicide Rate (1968)[e]	Reported Robbery Rate (1970)[e]	Nonwhite/White Unemp. Ratio (1970)[e]	Per Capita United Funds Contrib. (1970)[e]	% Eligible Vote for a Pres. (1968)	Med. School Years of Adults (1969)[e]	Cost for Moderate Income Family (1969)[e]	Suspended Part. Con. (1969)[a]	Levels of 2 Pollutants (69)[c] SO_2 NO_2	Estimates of Narcotics Addiction ('69)[a]	
New York	–∩●	●∩●	●●–	[illegible]	●∩●	●●●	[illegible]	●●–	●–●	[illegible]	●–∩	–●∩	●0●	– 0	●–●	N.Y.
L.A./Long Beach	––∩	∩––	●●●	–∩–	●●●	∩–●	–∩●	●●–	●–∩	–∩–	●●∩	∩∩●	●0●	0 –	●●●	L.A.
Chicago	∩●●	●●∩	●●–	––●	∩––	●●●	–∩●	●●●	●–●	–●∩	●∩∩	[illegible]	●0–	– ◆	●●●	Chi.
Philadelphia	–●●	●∩∩	●––	–●–	●–∩	––∩	–●●	●00	●∩∩	–∩∩	∩∩–	–●–	●–●	0 ◆	●●●	Phila.
Detroit	––	●●●	●●●	–●●	●–0	––∩	[illegible]	●∩●	●●–	–●∩	●∩∩	–∩∩	●0●	0 –	●●●	Detroit
Boston	–●0	●●●	●–∩	[illegible]	●●∩	–∩–	–●–	ddd	●––	–●∩	∩●–	[illegible]	●●●	0 ◆	●●●	Boston
S.F./Oakland	––∩	–––	●●●	[illegible]	●●●	∩–●	[illegible]	●●●	●–0	–●∩	●●∩	∩–●	●●0	◆ 0	●●●	S.F.
WASHINGTON	–00	●●●	●∩–	–∩●	●●●	●∩●	[illegible]	–●–	●––	∩–●	●●∩	–∩∩	●●–	◆ ◆	●●●	D.C.
Pittsburgh	∩–●	●–●	●–●	–●–	●––	––∩	–●–	●●●	●●∩	–●●	●∩∩	–●●	●–0	0 –	●●●	Pitts.
St. Louis	∩∩●	∩––	●––	–●●	●∩∩	●●●	–∩●	●–●	●●–	–∩∩	●–●	––∩	–––	0 –	●●●	St. L.
Cleveland	–∩∩	●●∩	●∩∩	––∩	●00	∩–∩	–∩–	[illegible]	●●–	–0–	●∩∩	–∩∩	●0–	0 0	●●●	Cleve.
Baltimore	∩●●	∩––	●–∩	–●∩	●–●	––∩	[illegible]	●●●	●–●	––0	●–∩	–∩–	●0●	0 0	●●●	Balti.
Houston	–●0	●–∩	●–∩	–●∩	●–∩	[illegible]	–∩–	●∩–	●∩–	●–●	–∩–	––●	●●–	◆ –	●●●	Houston
Minn./St. Paul	–––	●●–	●●●	∩●●	●●0	●●●	–●●	ddd	●●∩	–●●	●●∩	–∩●	●●0	◆ 0	●●●	Minn.
Dallas	–●–	●–∩	●●●	–●∩	●––	●∩●	–●–	ddd	●∩●	●–●	●●∩	–∩●	●●0	◆ 0	●●●	Dallas
Cincinnati	–●–	●–∩	●–●	–●●	●●–	∩∩●	–●∩	ddd	●●–	–∩∩	●∩●	–∩–	●0●	◆ 0	●●●	Cinci.
Milwaukee	–∩–	∩●–	●––	[illegible]	●●∩	●∩●	–●∩	ddd	●●–	–●–	●●●	∩∩●	●00	◆ 0	●●●	Milw.
Buffalo	∩∩●	●0∩	●–●	––∩	∩––	∩●●	–●–	ddd	●●–	–∩–	●∩●	––0	●●●	◆ ◆	●●●	Buffalo

* For Coding used in this table see page 160.
a/Latest year data available. b/Data available for only 12 metropolitan areas. c/Each of the two characters represents the level of one of the pollutants. (Each character is equivalent to the "2nd character" described on page 160.) d/Data available for only 7 central cities. e/Data not available.

QUALITY OF LIFE IN THE UNITED STATES – AN EXCURSION INTO THE NEW FRONTIER OF SOCIO-ECONOMIC INDICATORS

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QUALITY OF LIFE IN THE UNITED STATES – AN EXCURSION INTO THE NEW FRONTIER OF SOCIO-ECONOMIC INDICATOR

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I. INTRODUCTION

With the acceptance of Keynesian economics and the subsequent development of a system of national income and product accounts, such economic measures as gross national product, personal income and the unemployment rate have frequently been indiscriminately accepted as measures of our total well-being. As one economist has stated, "While there are other individual and social objectives, at least as important as making money, money income provides the principal measure of performance of the urban economy."[1] Whether our consideration is the urban, state, or national economy, money income has been readily accepted as an appropriate measure of both economic and social progress.

There are, however, increasing signs of discontent with the continued use of these traditional measures of economic progress as measures also of our political and social progress. Raymond Bauer has succinctly summarized this discontent in his statement: "For many of the important topics on which social critics blithely pass judgment, and on which policies are made, there are no yardsticks by which to know if things are getting better or worse."[2] Yet changes in our current attitudes are increasingly evident. The crisis in our cities in recent years has demonstrated, if nothing else, the urgent need to broaden our concern to include all aspects of the *quality of life* in our urban areas. The Federal Space Agency recognized several years ago the need to assess more precisely the social, economic, and political conditions in our society. And there have been discussions in the past of the need to establish a President's Council of Social Advisors akin to the present Council of Economic Advisors.[3]

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[1] Wilbur R. Thompson, *A Preface to Urban Economics* (Baltimore: Johns Hopkins Press, 1965) p. 61.

[2] Raymond A. Bauer, ed., *Social Indicators* (Cambridge: The MIT Press, 1966), p. 20.

Economists have long been aware of the many limitations of our current economic yardsticks. The problems of imputation, price indexes, and valuation of government output are well documented. And when the economic measures are used for purposes other than evaluation of strictly economic conditions, the limitations become not only structural but also conceptual. The national income and product accounts were not conceptually designed to measure changes in our total socio-economic environment. Yet their misappropriation to this use has been an error more of omission rather than of commission. For lack of anything better, social scientists, politicians, and the general public have resorted to the use of those quantitative measures currently available.

With the increasing dissatisfaction with the limitations of the traditional economic indicators and our awareness of the need to assess the impact of social and political phenomena on our total society, it is imperative that the new frontier of social indicators be explored. This paper will first explore the concept of social indicators, then discuss the weighting problem of combining numerous individual measures into a more aggregate measure of social well being, and finally examine the modeling problem of how such measures are actually constructed. The concepts that are developed will then be applied in measuring social well-being in eight different areas for each of the fifty states.

II. THE CONCEPT OF SOCIAL INDICATORS

With the existing sources of data it is possible to construct a limited number of social indicators to provide a much broader measure of state differences in living conditions than is now available. First, however, we must define what is meant by a social indicator. Throughout this analysis, we will adopt the following definition:

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[3] The federal government and the academic community are increasingly expressing their concern over the lack of sufficient measures with which to assess our socio-economic environment. Several years ago, NASA became a pioneer among government agencies in acting upon its concern with the impact of space exploration on society in general. The result of this concern was a volume edited by Raymond A. Bauer, *Social Indicators, op. cit.*, which has received widespread consideration by the national leaders in the United States, France, India, Canada and England. This volume, plus two issues of the *Annals of the American Academy of Political and Social Science*, published in 1967, represent the major published contributions in this relatively new area. The U.S. government has taken more than passive interest in developing social accounts, and in July of 1967, the Office of Assistant Secretary of Social Indicators, Department of Health, Education, and Welfare, was established with the purpose of preparing the first Social Report of the President.

> A social indicator is probably most usefully defined as an aggregate or representative welfare measure; that is, as a statistic that measures the extent to which some goal of general interest has been achieved (rather than the government expenditures or inputs used to achieve that goal). The indicator can be obtained by aggregating other statistics into a meaningful summary statistic or by selecting from some properly defined set of statistics one series whose movements are reasonably representative of the rest.[4]

The development of a set of social indicators with which to assess interregional differences in the *quality of life* in the United States requires the following steps: (1) selection of the geographical unit of analysis: (2) specification of the general areas of social concern for which indicators are to be developed; (3) collection of a relevant set of basic statistics from which a summary statistic can be created; and (4) aggregation of the basic statistics to obtain a limited number of meaningful social indicators. The first three steps will be discussed below, while the "weighting" problem inherent in the final step will be discussed in the following section.

In this study, states were chosen as the basic unit of analysis. There were several reasons for this selection. All of the literature to date has been addressed to the question of creating a set of social indicators at the national level. While this is certainly an appropriate level for the initiation of such an undertaking, we must also consider what problems may be unique in extending our concepts to sub-national levels. In particular, consideration should be given to the unique problems that may be encountered as we attempt to develop social indicators for state and city decision-making units. In addition, the public sector of our economy must receive considerable attention in any relevant social indicator. And because state and local governments have somewhat autonomous and clearly more dominant roles than the federal government has in providing those public services that have a direct and immediate impact on the *quality of life* provided the American citizen, it becomes imperative that the concept of social indicators be developed concurrently at all levels of government. At the state and local levels there may be far less certainty about the attributes of any social indicators. Governors and state legislatures may likely be less than enthusiastic in their acceptance of any quantification of an area previously so elusive as, for example, that of the extent of racial inequality existing within the state. Such political reluctance must be recognized early in this attempt to create a new social accounting system. Finally, states were chosen as the basic unit of analysis because the data necessary for the construction of social indicators are most readily available at the state level.

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[4] Mancur Olson, Jr., "An Agenda for the Development of Measures of the Progress of a Racial or Ethnic Group," U.S. Department of Health, Education, and Welfare (February 6, 1968), unpublished paper, p. 1.

The use of states as the basic unit for comparison, which is dictated by the availability of sufficient relevant data, raises some rather significant problems. First, an implicit homogeneity assumption is made concerning the *quality of life* throughout the state. Clearly, within any state, social and economic conditions will vary considerably between urban and rural areas, between the central city and the suburbs, and even from neighborhood to neighborhood within the central city. Such variations cannot, unfortunately, be taken into consideration until data become more readily available and the techniques of developing social indicators are more fully developed. Second, given the open economy of the states and the rapid mobility of our population, specific assumptions must be made about exactly to whom the social attributes available within a state will accrue. This problem becomes quite crucial in assessing, for example, state differences in the quality of their educational systems. Do the services provided by Yale University and the University of Michigan accrue to residents of the states in which these schools are located or is the population that is served by these schools distributed throughout the nation?

In selecting the relevant areas for which social indicators should appropriately be developed, the researcher is faced with an endless task. The list of our current areas of social concern is almost unlimited. So for simplicity of choice, eight of the eleven domestic goal areas included in the Report of the President's Commission on National Goals[5] published in 1960 were selected for this present study.

The Commission on National Goals was a nonpartisan group appointed by President Eisenhower to suggest a set of goals for vital areas of our national life. The eleven members of the Commission, supported by private funds and having no direct connection with the federal government, used the contributions of over 100 leading authorities and specialists in defining the final goals. The objective of the goals report was to stimulate a continuing discussion and debate among Americans concerned with the *quality of life* in the nation; adoption of these recommended goals for use in this study is in keeping with this objective. We do not intend to suggest that these goals represent the ultimate set of normative variables with which to assess the existing *quality of life*, but they do represent the latest consensus of any type on a definitive set of goals for the nation as a whole.

The eight areas for which social indicators were developed are:

- Individual status: Enhancing personal dignity, promoting maximum development of capabilities, and widening the opportunities of individual choice.

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[5] Report of the President's Commission on National Goals, *Goals for Americans* (Englewood Cliffs, New Jersey: Prentice-Hall, 1960).

- Individual equality: Eliminating discrimination on the basis of race.

- Education: Improving the quantity and quality of education.

- Economic growth: Increasing both the quantity and quality of growth, including capital investment in the public sector, improving the standard of living, and providing education for a more capable and flexible work force.

- Technological change: Increasing the effort in research and the availability of manpower and facilities to maintain economic growth and improve living conditions.

- Agriculture: Improving the *quality of life* in the agricultural sector of our economy.

- Living conditions: Alleviating general poverty and the decayed conditions of the cities.

- Health and welfare: Improving the levels of welfare assistance, vocational rehabilitation, and provision of medical services in both the public and private sectors of the economy.

With the selection of the general areas for which social indicators are to be developed, it is then necessary to collect the relevant set of basic statistics from which a summary statistic can be created. This task proved to be the most difficult phase of the study, since data on the social and political conditions in our society are much less developed and available than data pertaining to the economic conditions. A total of 72 different measures were used in constructing the final eight indicators. These measures and their sources are listed in the Appendix. The selection of these individual measures must be carefully considered since the quality of the summary indicator is quite clearly dependent upon the reliability and relevancy of the initial measures from which it was constructed. Every effort was made to relate the measures as closely as possible to the interpretation given each of the eight general areas as discussed in the President's Commission Report and related papers.

Measures of output were carefully distinguished from those of inputs to avoid duplication of what is essentially identical information, assuming a relevant relationship can be defined between the two. Such a dichotomization is complicated by an inability to specify clearly the output of certain areas. In the area of education, for example, the distinction between outputs and inputs is quite apparent and presents few problems. The quantity and quality of the educational service can be assessed by the level of achievement on tests and years of schooling. The inputs to achieve this output include the availability of educational facilities and the socio-economic environment in which the educational process occurs.[6]

In other areas, such as health and welfare, the distinction between inputs and outputs is far less clear. The output could appropriately be measured by the age-race adjusted mortality rates for each state and inputs could be assessed by the number of physicians and hospital beds that are available to the residents of a given state. Such a formulation implies the existence of a given technical relationship or, in terms of the economist, a production function, for the health sector of the economy. Unfortunately, the research in this area is far less developed than in the previous example of education. And for certain other areas, such as racial equality and individual status, it is questionable whether such a technical relationship is even feasible. In these cases, individual measures were carefully selected to reflect the general intent of the area for which an overall indicator is being developed.

The entire analysis is highly interrelated, reflecting the actual conditions existing in our socio-economic environment. Some of the measures and indicators themselves are used to develop other indicators of the study. "Individual Status", for example, is measured by equality of individual opportunity, itself a separate indicator; an index of the quality of medical services, living conditions, and education; and the level of welfare and social security payments. All of the factors promote the maximum development of individual opportunities and contribute to the enhancement of personal dignity. Such interrelationships cannot, and should not, be avoided if the model is to have any correspondence to the real world.

III. THE WEIGHTING PROBLEM

Once the social indicator has been defined, it is possible to collect a set of basic statistics from which to construct the aggregate measure. But the quite formidable problem of weighting each of these statistics remains to be resolved. Many of the previous attempts at developing social indicators have simply weighted all of the basic statistics equally in deriving an aggregate measure. This approach, while straightforward and simple, produces a measure that is somewhat suspect. Many basic statistics tell the same story. They are highly correlated with each other. An individual's income, educational level and occupation are all highly correlated. To weigh all of these measures equally in deriving a simple measure of that individual's economic well-being could be quite misleading.

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[6] For an exhaustive study of the factors which influence educational achievement see James S. Coleman and others, *Equality of Educational Opportunity* (Washington, U.S. Department of Health, Education, and Welfare, Office of Education, 1966). This study of racial differences in educational opportunity, which was based on a survey sample of more than 645,000 pupils located in 4,000 public primary and secondary schools, has generated a substantial amount of new discussion and research. While its conclusions are far from readily accepted, it has served a momentous service by at least challenging the conventional wisdom that school and teacher characteristics are the most important determinants of educational achievement. A critique of the sampling and statistical techniques used in this study and, consequently, the findings of the study are contained in Samuel Bowles and Henry M. Levin, "The Determinants of Scholastic Achievement–An Appraisal of Some Recent Evidence," *The Journal of Human Resources, 3,* (Winter 1968), pp. 3-24.

Factor analysis provides one mathematical approach to resolution of the weighting problem.[7] It is the object of factor analysis to represent a constructed, nonobservable social indicator, I, in terms of several underlying factors or hypothetical constructs. A linear model is employed in the analysis which makes a distinction between two approaches: (1) to extract the maximum variance from the original set of statistics, and (2) to "best" reproduce the observed correlations in the original set of statistics.

The mathematical procedure for extracting the maximum variance is formally called "component analysis" where each of n observed variables is described linearly in terms of n new uncorrelated components $F_1, F_2, \ldots F_n$:

$$z_j = a_{j1}F_1 + a_{j2}F_2 + \ldots a_{jn}F_n$$

where z_j is the standardized form of the observed variable x_j.

Each component, in turn, makes a maximum contribution to the sum of the variances of the n variables. In a practical problem, component analysis provides an efficient summarization of the data since a few of the components will generally account for a large amount of the total variance. Once the factor loadings or weights for each variable are determined, it is possible to aggregate the standardized initial statistics into a set of indicators. These aggregated indicators are the "factor scores" associated with each component. The factor score for component, F_p, is given by:

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[7] The following discussion of the mathematical aspects of factor analysis represents a paraphrasing of the presentation contained in: Harry J. Harman, *Modern Factor Analysis*, 2nd ed., rev., (Chicago: The University of Chicago Press, 1967). Any similarity between the discussion and that in Harman is intentional so that we have to be concerned only with presenting the generalized concept of factor analysis. For an explicit discussion of the mathematical techniques used in the present analysis, the reader is referred to Harman, *op. cit.*, Chapters 2,5,6,8, and 16.

$$I_p = \sum_{j=1}^{n} \frac{a_{jp}}{\lambda p} z_j$$

where λ_p is the eigenvalue.[8]

A set of factor scores, m, will, in practical problems, reduce the initial set of statistics to some set of aggregated indicators $m < n$ which will account for the major portion of the variance in the original set of data.

The second model, called the "factor analysis" model, seeks to "best" reproduce the observed correlations in the original set of statistics. The mathematical form of the factor analysis model is:

$$Z_j = b_{j1}F_1 + b_{j2}F_2 + \ldots + b_{jm}F_m + c_jU_j$$

$$(j = 1,2, \ldots , n)$$

Each of the n observed variables is described linearly in terms of m (usually much smaller than n) common factors and a unique factor. The common factors account for the correlations among the variables while the unique factor accounts for the remaining variance (including error) of that variable. The factor scores for the factor analysis model cannot be exactly determined as for the component analysis model and must be estimated using conventional regression methods.[9]

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[8] The eigenvalue has several important properties in factor analysis. Let V_p represent the value of the variance which the model seeks to maximize:

$$\lambda_p = V_p = \sum_{j=1}^{n} a^2_{j1}$$

In other words, the eigenvalue is equal to the maximum amount of variance accounted for by factor F_p and, in addition, equals the sum of the squared factor weights.

[9] The factor scores for the component model can be determined exactly and are unique since the model involves n common components, giving a nonsingular matrix. But the factor model involves both common and unique factors with the total number of factors exceeding the number of variables. An inverse does not exist for such a singular matrix so the accepted procedure is to estimate the factor scores by regressing factor F_p on the n variables. The factor score can be estimated from the correlations of the variables with the factor and the correlations among the variables.

Both the component and factor analysis models start with the observed correlation matrix, R, of the initial data. The set of n variables is then analyzed in terms of common factors by inserting unities in the diagonal of R or in terms of common and unique factors by inserting communalities in the diagonal of R. Since there is no *a priori* knowledge of the values of the communalities, they must be estimated in the factor analysis model. (Note that they are implicitly assumed to equal unity in the component model.) The advantage of the factor model is that it enables more information to be included in the analysis, assuming that the estimates of the communalities existing among the original data are valid.

Both the component and factor analysis models were used in constructing the state rankings for the eight social indicators. As there was very little difference in the final rankings between these two models, the results from the factor model are given in this paper, since this model embodies more information concerning the initial set of measures. The factor scores for the first factor for each indicator were used in ranking the states, and in no case did the first factor account for less than 50 percent of the total variance in the initial set of data.

IV. THE MODELING PROBLEM

This section of the paper discusses the modeling technique used in one of the eight areas–equality of racial opportunity. It is hoped that this example will help clarify the general mathematical discussion presented above and assist the reader in assessing the modeling and weighting techniques that were used throughout this analysis.

The meaning of equality of opportunity is hardly self-evident. To some readers, particularly the white middle-class suburbanite one or two generations removed from Eastern Europe, equality implies the opportunity of long hours of hard work, diligent savings, temporary domicile in the large city ghetto, and education for the young. This was the formula for success when he started at the bottom of the economic ladder, and what was good enough for his family is good enough for the new class of immigrants. To the concerned white liberal who espouses the virtues of equality and justice, racial equality may connote the opportunity for anyone to purchase a home where he pleases, given his economic capacity, and equal access to employment and education, so long as he abides by the existing laws. But the young black from the city ghetto may take a far different view. Equality of opportunity may mean a $130 a week job, irrespective of whether he is educationally or emotionally qualified; it may mean greater than proportionate expenditures on schools, recreation facilities, and health and welfare than is spent in the white suburbs.

The definition of equal racial opportunity adopted throughout this paper will be more akin to that of the concerned white liberal, not so much reflecting the value system of the author as reflecting the nature of the data which are available for such an analysis. Consequently, the analysis may reflect a more middle-of-the-road position. To the extent that racial discrimination cannot be corrected without an initial imbalance of expenditures and initiation of opportunities, this study will be somewhat conservative.

The model adopted in the study contains three major elements: (1) current economic status, (2) current economic discrimination, and (3) discrimination in human investment.

The logical point of departure for constructing a model is with the best aggregate socio-economic indicator that is now available–personal income. Racial differences in personal income, adjusted to account for structural differences among the states, can be readily obtained. But even such adjusted income data are inappropriate for our present consideration. Interstate differences in nonwhite personal income will reflect two levels of current economic status of the nonwhite relative to the white. The nonwhite may be at a relative economic disadvantage to the white within the state, and both the nonwhite *and* white may be at a relative disadvantage to residents of a more affluent state. A nonwhite living in Arkansas, for example, will have an income significantly less than that of a white person who also is a resident of Arkansas. But in addition, the nonwhite may be double cursed since he lives in a state that has a rather poor economy where the average income for all races is well below the average income level in the nation.

This situation points out the necessity of carefully defining the objective of the study. Our objective is to develop a social indicator of the degree of racial inequality existing *within* a given state. Our concern is that *given* a certain economic level within a specific state, we must then determine how equitably that economic level is made available to all the residents within the state.

The current economic status of the nonwhite within a state is hardly a sufficient aggregate indicator of racial inequality of opportunity. A nonwhite may receive less income, not because of discrimination, but simply because he works in a lower paid occupation or he has less education and the value of his marginal product is low. In the second element of the model, current economic discrimination, differences in income levels between the whites and nonwhites are compared after adjusting for occupational and educational differences. Given that a white and nonwhite are employed in the same occupation or have the same amount of education, what are the differences in their income levels? We still do not have a sufficient indicator. Current educational levels and occupational attainments are the accumulated result of investment in human capital. Discrimination in the investment in such areas as education, health, and living conditions reduces the future level of productivity of human capital.

The major elements of the model are now complete, not that we have a perfect measure of equality, for there are many other vital areas of consideration. But we have exhausted the limit of our available data and we have provided a beginning, admittedly quite embryonic, for future development. Our model appears as follows in its mathematical form:

$$I_{RD} = a_1X_1 + b_2X_2 + c_3X_3$$

$$= a_1 \sum_i a_{1i}x_{1i} + b_2 \sum_j b_{2j}\ x_{2j} + c_3$$

$$(c_4 \sum_k d_kx_{3k} + c_5 \sum_m x_{4m} + c_6 \sum_n x_{5n})$$

where $X_1 = \sum_1 a_{1i}x_{1i}$

$$X_2 = \sum_j b_{2j}x_{2j}$$

$$X_3 = c_4 \sum_k d_kx_{3k} + c_5 \sum_m x_{4m} + c_6 \sum_n x_{5n}$$

I_{RD}: Socio-Economic Indicator for Inequality of Racial Opportunity

X_1: **Current Economic Status**

x_{11} : ratio of nonwhite to white per capita median income adjusted for urban-rural differences in population distribution

x_{12} : ratio of nonwhite to white employment rates.

X_2: **Current Economic Discrimination**

x_{21} : ratio of nonwhite to white income adjusted for occupation differences.

x_{22} : ratio of nonwhite to white income adjusted for educational differences.

X_3: **Discrimination in Human Investment**

$\sum_k d_kx_{3k}$: education.

x_{31} : educational attainment as measured by the ratio of the white to nonwhite high school drop-out rate.

x_{32} : educational attainment as measured by the ratio of nonwhite to white college graduate rate.

x_{33} : educational quality as measured by the ratio of white to nonwhite percent of draftees who failed the mental requirements portion of their preinduction examination.

$\sum_{m} x_{4m}$: health

x_{41} : ratio of white to nonwhite age adjusted mortality rates

$\sum_{n} x_{5n}$: environmental conditions

x_{51} : urban housing density as measured by the ratio of white to nonwhite percent of occupied units with 1.01 or more persons per room.

x_{52} : quality of urban housing as measured by the ratio of nonwhite to white percent of occupied urban housing units which are sound and have all plumbing facilities.

x_{53} : segregation of urban housing as measured by a weighted index of the extent of segregation by census block.

In assembling the basic data, three primary considerations were found to be essential:

First, the data had to be "standardized" to exclude extraneous elements that would bias the results. Where necessary, all data were adjusted for urban-rural and sex and age structure differences among the states. In the areas of current economic status and current economic discrimination, the data had to be adjusted for sex because of the quite different occupational structures existing for males and females. A sample analysis of the data indicated that the same trend occurred whether such data included a weighted value of data for males and females or only the data for males.[10] Information for males was, in general, included in the final study as the expense of assembling the data was quite significant.

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[10] A structured sample was taken of the data used in measuring current economic status and current economic discrimination by race for both sexes separately. The data were then weighted by the percent of the population within a state within each category and compared to the data for males only. There was not found to be any appreciable difference in the results.

Second, a clear distinction should be made between inputs and outputs. Akin to the economic indicator of the value of all our goods and services–gross national product–a socio-economic indicator must carefully distinguish between data reflecting the final output of a social system and the inputs that went into that system. While this distinction may seem obvious, it is quite frequently overlooked in the current practice of presenting an *ad hoc* collection of socio-economic data.

Third, data were collected to reflect both the quantity and quality aspects of the specific area being measured. Measures of quantity are much more readily available than those of quality, creating a quite natural tendency to bias the resulting indicator in favor of quantity. Cognizance must be taken of this inadvertent bias by diligently seeking measures of quality. While a few quality indicators are available in the areas of education and housing conditions, the measurement of the quality of our socio-economic environment is sorely in need of vitalization.

The data represent a wide range of consideration, from income levels to segregated housing. Quite naturally, information contained in some of the data will be similar to that contained in the other data. As indicated by the simple correlation coefficients shown in Table 1, there is a substantial amount of correlation between the specific measures. As would be expected, income adjusted for occupation is highly correlated with income adjusted for education since education is a significant prerequisite for access to the majority of occupations. Conversely, the employment rate has a low correlation with segregated housing, the latter being more a social phenomenon. The high degree of correlation existing between some of the data and the wide range of the degree of correlation, ranging from a high of 93.1 percent to a low of 6.1 percent, raise the interesting problem of weighting in constructing the overall socio-economic indicator. As was discussed in Section III, factor analysis was used to develop a set of weights.

Since the weighting system is not unique, three different social indicators of equality of racial opportunity were developed.

Indicator I applies the component analysis model to the two major areas: Current Economic Status, X_1, and Current Economic Discrimination, X_2, individually. The same approach is then applied to the sub-areas of education, health, and environmental conditions within the major area of Discrimination in Human Investment, X_3. The three sub-areas are then weighted equally in obtaining the aggregate value for X_3. Finally, all three major areas, X_1, X_2, and X_3, are weighted equally in obtaining the overall value of the racial discrimination indicator, I_{RD}. Indicator II applies the factor analysis model to all the initial data simultaneously using squared multiple correlation coefficients as

Table 1 Simple Correlation Matrix of Basic Data

	x_{11}	x_{12}	x_{21}	x_{22}	x_{31}	x_{32}	x_{33}	x_{41}	x_{51}	x_{52}	x_{53}
x_{11} (median income)	1.000	0.529	0.817	0.778	0.387	0.604	0.687	0.668	0.479	0.751	0.552
x_{12} (empl't rate)		1.000	0.188	0.066	0.425	0.336	0.304	0.307	0.061	0.447	0.154
x_{21} (income adj. for occupation)			1.000	0.931	0.295	0.662	0.640	0.513	0 542	0.706	0.476
x_{22} (income adj. for education)				1.000	0.088	0.535	0.554	0.525	0.557	0.623	0.517
x_{31} (high school drop-out rate)					1.000	0.769	0.681	0.066	0.174	0.257	0.303
x_{32} (college graduate rate)						1.000	0.618	0.294	0.383	0.420	0.353
x_{33} (pre-induction mental exam)							1.000	0.368	0.425	0.725	0.564
x_{41} (mortality rate)								1.000	0.531	0.466	0.348
x_{51} (urban housing density)									1.000	0.48[illegible]	0.298
x_{52} (quality of urban housing)										1.000	0.463
x_{53} (segregated housing)											1.000

estimates of existing communalities. Indicator III applies the component analysis model to all the initial data simultaneously.

These three indicators, each with different weights associated with the initial data, are similar in one basic aspect. They all depend upon the previous definition of inequality of racial opportunity to select the appropriate set of initial data. With Indicators II and III, this is the sole purpose of the definition as the data are all treated as equal inputs in the factor and component analyses. But with Indicator I, the definition assumes a much more dominant role. Not only does it serve to select the initial set of data, but also it implies information on the weighting of the data. The three major elements, X_1, X_2, and X_3 are assumed to contribute equally in determining the degree of discrimination in human investment.

The weights used in constructing the three socio-economic indicators of inequality of racial opportunity are given in Table 2. These are the weights associated with the first factor in the mathematical solution. As we recall, the first factor makes the maximum contribution toward accounting for the total observed variance in the initial data. Thus, the weights used in constructing Indicator III accounted for 53.5 percent of the given variance. There is very little difference in the weights between Indicators II and III which applied factor and component analyses to the initial data, respectively. The weights used in constructing Indicator I cannot be compared with those for the other two due to the quite different treatment of the sub-elements of the basic model, as shown by the weights in parentheses. For each of the sub-areas, the first factor accounted for a substantially greater amount of the initial variance as would be expected with much smaller sets of initial data.

The sets of weights given in Table 2 were then applied to the standardized initial data to obtain the results for each state as presented in the following section.

The results from the three socio-economic indicators are shown in Table 3 where the states are ranked according to the value of their factor scores. The states indicating the greatest equality of opportunity are ranked highest where, according to our model, Hawaii is clearly the least segregated of the 40 states that have significant nonwhite populations. Colorado, California, Minnesota, and Washington vie for the other high positions with some variation in their ranking according to the particular indicator. The most segregated states are still in the Deep South despite the existence of large ghettos in the northern cities.

There is actually very little difference in the rankings of the states for each of the indicators. The Spearman rank order correlations show that the rankings vary in correlation from 94.4 percent between Indicators I and II to 96.0

Table 2 Factor Weights Used In Construction of Socio-Economic Indicators of Inequality of Racial Opportunity

Elements of Model	Weights for Indicator I	Percent of Variance Accounted for by Weights of Indicator I	Weights for Indicator II	Weights for Indicator III
X_1	(1.0)[a]	78.5	-	-
x_{11}	13.8783		0.9177	0.9225
x_{12}	8.6525		0.4204	0.4364
X_2	(1.0)	96.6	-	-
x_{21}	12.4030		0.8903	0.8851
x_{22}	11.5411		0.8251	0.8185
X_3	(1.0)		-	-
$\Sigma d_k x_{3k}$	(1.0)		-	-
x_{31}	7.3323	94.2	0.5321	0.5257
x_{32}	20.3961		0.7473	0.7451
x_{33}[b]	14.4030	100.0	0.8345	0.8306
Σx_{4m}	(1.0)		-	-
x_{41}	10.8204	100.0	0.6101	0.6402
Σx_{5n}	(1.0)	72.1	-	-
x_{51}	7.3530		0.5861	0.6256
x_{52}	12.7255		0.8107	0.8129
x_{53}	3.6817		0.5886	0.6345
Percent of variance accounted for by weights		-	52.3%	53.5%

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[a] The unitary values in parentheses indicate the equal weights associated with various sub-elements of the basic model in constructing Indicator I.

[b] In constructing Indicator I, educational quality, x_{33} , was given equal weight to educational quantity, x_{31} and x_{32} .

Table 3 State Rankings for the Three Social Indicators of Inequality of Racial Opportunity

State	I	II	III	Indicator III Expressed as a Percentage Measure
Hawaii	1	1	1	60.8
Colorado	2	5	5	57.3
California	3	3	3	58.3
Minnesota	4	2	2	60.7
Washington	5	4	4	57.3
Iowa	6	7	7	52.7
Massachusetts	7	9	8	51.4
Oregon	8	6	6	54.7
Wisconsin	9	8	9	49.4
Michigan	10	12	11	48.2
Connecticut	11	17	13	47.8
New York	12.5	10	12	48.0
Indiana	12.5	15	17	46.2
Kansas	15	20	19	45.0
Illinois	15	13	20	45.0
Pennsylvania	15	11	16	46.3
Ohio	17	14	14	47.2
New Jersey	18	22	18	45.4
Alaska	19	21	10	48.7
Missouri	20	18	22	43.6
Nebraska	21.5	19	21	43.7
West Virginia	21.5	16	15	47.0
Arizona	23	26	23	40.9
New Mexico	24	30	25	41.4
Maryland	25	27	29	40.2
Kentucky	26	23	24	42.4
Oklahoma	27	24	26	41.3
Delaware	28	29	28	40.3
Texas	29	31	30	39.3
Tennessee	30	28	31	37.7
Virginia	31	33	32	35.9
Louisiana	32	35	34	35.2
North Carolina	33	32	35	34.8
Alabama	34	34	37	33.1
Florida	35.5	38	36	33.2
Georgia	35.5	36	38	32.5
South Dakota	37.5	25	33	35.5
Arkansas	37.5	37	27	42.7
Mississippi	39	40	39	29.5
South Carolina	40	39	40	29.4

percent between Indicators II and III.[11] Since the correlation would be 100.0 if there was perfect agreement, it is quite evident that all three indicators give nearly identical results.

The rankings shown in the first three columns of Table 3 are, of course, ordinal and give no indication of whether or not Hawaii and California are approaching a fully integrated society. The only information contained in such an ordinal ranking is that a Negro, on the average, has a greater equality of opportunity in Massachusetts than he does in Kentucky, but whether that difference in opportunity is or is not significant is indeterminate. Just how much better off is the nonwhite in Hawaii than the nonwhite in South Carolina?

An answer to this question requires cardinal indicators, indicators that can distinguish the degree to which equality of opportunity in one state exceeds that in another. Such cardinal information is contained in the factor scores, but the scores themselves have little intuitive meaning. To enhance the interpretation of the factor scores, they have been transformed to a percentage scale. Factor scores were calculated for two hypothetical states which have perfect integration and perfect segregation. A perfectly integrated state would achieve a score of 100 percent while the converse would rate a score of 0 percent. A linear mapping of Indicator III was then performed onto this percentage range.[12] The

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[11] Spearman rank order correlations, r_s are determined by the following equation:

$$r_s = 1-(6\sum_i d_i^2)(1/n(n^2 - 1))$$

where d_i represents the difference in ordinal rank value for two series of data. The value for r_s will equal +1.0 whenever the rankings are in perfect agreement, 0 when no relationship whatsoever occurs, and −1.0 where there is perfect disagreement. The rank order coefficients for the three socio-economic indicators are:

Spearman Rank Order Correlations
(All significant at the one percent level)

	I	II
II	0.944	
III	0.951	0.960

[12] The factor score for a perfectly integrated state was calculated by assuming that it achieved a value of 100.0 percent for all of the basic statistics. As we recall, all the basic data represent ratios of nonwhite to white or vice versa for the specific areas of measurement. Conversely, a perfectly segregated state would achieve a hypothetical value of 0.0 percent in all areas. These extreme hypothetical factor scores for Indicator III were 6.6523 and −5.1926, establishing the relevant percentage range. The actual factor scores were then added onto this percentage range according to the following equation:

Y_i (percentage value for state i) = (X_i (factor score) + 5.9926)(1/11.8449) results of this linear mapping are given in the fourth column of Table 3 where it is readily apparent that while Hawaii, Colorado, and California rank at the top, the nonwhites in these states have access to less than 60 percent of the equality of opportunity available to the white residents of the states. Even the "best" states in the nation are far from a perfectly integrated society; and in the South, the nonwhite exists in a substantially greater segregated society, enjoying less than 30 percent of opportunity made available to the white majority.

V. CONCLUSIONS

The results of the state rankings for all eight social indicators, shown in Table 4, indicate that California leads the nation in the areas of individual status, education, and technological change. Living conditions are highest in Connecticut while Hawaii provides the least segregated society. The highest ranking states in the eight areas for which social indicators have been developed are generally located in the North and Far West. The northeastern states of Connecticut, Massachusetts, and New York fare quite well. In the Midwest, Michigan, Minnesota, and Wisconsin all rank high for the majority of the eight areas. And on the West Coast, California ranks substantially above the surrounding states. The Southern states, primarily in the South-Central and South-Atlantic regions of the nation, are among the lowest in the rankings. Alabama, Arkansas, Mississippi, and South Carolina invariably rank near the bottom for most of the areas. There are, however, some significant individual exceptions within these extreme states. For instance, Michigan fares rather poorly in welfare and Alabama ranks relatively high in technological change.

These rankings represent a static analysis which attempts to assess state differences in certain socio-economic areas at one point in time. But the economic, social, and political conditions existing in any state are undergoing continuous, dynamic change. From a policy standpoint, a more relevant issue would concern the nature, direction, and rate of change in the *quality of life* within the various states or regions in the nation. Such a dynamic analysis, unfortunately, cannot be made with the current lack of historical data, particularly in the areas of racial equality and health and welfare.

It is readily obvious that the development of a set of social indicators is only the initial task. The causal relationship existing between any indicator and specific public or private policy programs in our society is a much more difficult problem to be resolved. As we have learned from our experience in developing a quantitative measure of gross national product where the causal relationship between fiscal and monetary policy and the level of gross national product is a far from resolved issue, this task could well be quite formidable long after social accounts become commonplace. But the task will be exceedingly more difficult in the area of social indicators. The social indicators represent aggregations of basic statistics which are obtained from the application of certain mathematical

Table 4 Quality of Life in the United Ststes-Individual State Rankings for the Eight Social Indicators, 1960-1965

	Individual Status	Racial Equality*	Education	Economic Growth Quality	Technological Change	Agriculture	Living Condition	Health and Welfare
Alabama	47	34	49	38	21	48	47	44.5
Alaska	32	19	37	47	49	35.5	26	25
Arizona	30	23	5.5	27	28	1	31	38
Arkansas	46	37.5	44	42	35	49	41	36
California	1	3	1	3	1	2	3	14
Colorado	13	2	18.5	16.5	19	8.5	24	6
Connecticut	4	13	4	7	16	8.5	1	9
Delaware	27	28	21	4	29	12.5	8	3
Florida	29	35.5	36	15	7	34	37	42
Georgia	48	35.5	46	22	24	41	45	39
Hawaii	22	1	35	13	40	15	7	27
Idaho	24	-	9	25	43	12.5	18	44.5
Illinois	5	15	8	5	10	7	14	21
Indiana	23	12.5	13.5	12	17	17.5	34	37
Iowa	15	6	23	10	26	4	29	33
Kansas	20	15	12	30	31	17.5	38.5	34
Kentucky	40	26	40	24	30	45	27	46
Louisiana	41	32	41	41	25	40	49	31
Maine	36	-	45	49	50	37	15	23
Maryland	26	25	18.5	2	15	21.5	21	5
Massachusetts	3	7	2	18	4	27.5	9	12
Michigan	10	10	16	1	8	31	13	41
Minnesota	9	4	17	6	11.5	21.5	10	1
Mississippi	50	39	47	35	38	50	46	48
Missouri	38	20	28	39	20	38	36	28
Montana	19	-	25	46	47	5.5	23	19
Nebraska	31	21.5	10	23	39	10.5	40	29
Nevada	18	-	31	26	44	8	5	35
New Hampshire	16	-	33	33.5	42	32	19	22
New Jersey	6	18	5.5	19	9	10.5	4	24
New Mexico	39	24	32	48	36	35.5	32	43
New York	2	12.5	3	16.5	2	19	2	2
North Carolina	45	33	48	32	18	43.5	44	33
North Dakota	28	-	27	20	41	21.5	33	8
Ohio	14	17	29	29	6	25	17	30
Oklahoma	34	27	20	45	23	39	43	17
Oregon	12	8	13.5	8	32	16	11	11
Pennsylvania	17	15	24	40	5	29.5	16	16
Rhode Island	7	-	11	31	37	25	6	4
South Carolina	49	40	50	37	33	43.5	48	50
South Dakota	37	37.5	26	44	48	21.5	35	18
Tennessee	44	30	42	21	22	46	38.5	37
Texas	43	29	34	33.5	3	33	50	49
Utah	21	1	7	28	27	25	20	40
Vermont	33	-	38	36	45	29.5	25	10
Virginia	42	31	39	9	16	42	42	26
Washington	11	5	15	14	13	14	12	20
West Virginia	35	21.5	43	50	34	47	30	15
Wisconsin	8	9	30	11	11.5	27.5	22	7
Wyoming	25	-	22	43	46	5.5	28	32

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* Data available for only 40 states.

techniques. There is no underlying theory of causal relationships nor is there the existence of a generally accepted weighting system. The Keynesian model and market-determined prices provide both of these important ingredients in the construction and causality analysis of our current economic indicators. To simply apply the statistical techniques of multiple-regression analysis, for example, to a derived social indicator as the dependent variable, seriously impairs any causality implications that may be made. Various socio-economic explanatory variables will be significant in their causality impact upon the individual measures that are included in the aggregate statistics, but the impact upon the aggregate statistic itself is far from obvious due to the nature of its construction.

REFERENCES

1. *Annuals of the American Academy of Political and Social Science*, "Social Goals and Indicators for American Society," Vols I and II (May 1967 and September 1967).

2. Arrow, Kenneth, *Social Choice and Individual Values* (New York: John Wiley and Sons, Inc., 1951).

3. Batchelder, Alan, "Decline in the Relative Income of Negro Men," *Quarterly Journal of Economics*, Vol. 78 (November 1964), pp. 525-48.

4. Bauer, Raymond A., ed., *Social Indicators* (Cambridge: M.I.T. Press, 1966).

5. Becker, Gary, *The Economics of Discrimination* (Chicago: The University of Chicago Press, 1957).

6. Bergson, Abram, "A Reformulation of Certain Aspects of Welfare Economics," *Quarterly Journal of Economics* (February 1938), pp. 310-34.

7. Blalock, Hubert M., *Social Statistics* (New York: McGraw-Hill, 1960).

8. Bowles, Samuel, and Levin, Henry M., "The Determinants of Scholastic Achievement–An Appraisal of Some Recent Evidence," *The Journal of Human Resources*, 3 (Winter 1968), pp. 3-24.

9. Brazer, Harvey E., and David, Martin, "Social and Economic Determinants of the Demand for Education," in *Economics of Higher Education*, Selma J. Mushkin, ed. (Washington: U.S. Department of Health, Education, and Welfare, Office of Education, 1962), pp. 21-42.

10. Carmichael, Stokely, "What We Want," *New York Review of Books*, Vol. 7, No. 4 (September 22, 1966), p. 5.

11. Coleman, James S., *et al.*, *Equality of Educational Opportunity*, U.S. Department of Health, Education, and Welfare, Office of Education (Washington, D.C.: 1966).

12. Coleman, James S., "Equality of Educational Opportunity: Reply to Bowles and Levin," *The Journal of Human Resources*, 3 (Spring 1968), pp. 237-46.

13. Denison, Edward F., *The Sources of Economic Growth in the United States* New York: Committee for Economic Development, January 1962).

14. Drewnowski, Jan, and Wolf, Scott, "The Level of Living Index" (Geneva: United Nations Research Institute for Social Development, 1966).

15. Dorfman, Robert, ed., *Measuring Benefits of Government Investments* (Washington: The Brookings Institution, 1965).

16. Eckstein, Otto, "A Survey of the Theory of Public Expenditure Criteria," in *Public Finances: Needs, Sources, and Utilization* (Princeton: Princeton University Press, 1961).

17. ________, *Water Resources Development, The Economics of Project Evaluation* (Cambridge: Harvard University Press, 1961).

18. Fellner, William, "Operational Utility: The Theoretical Background and a Measurement", in *Ten Economic Studies in the Tradition of Irving Fisher* (New York: John Wiley and Sons, Inc., 1967).

19. Gilman, Harry J., "Economic Discrimination and Unemployment," *American Economic Review*, Vol. 40, No. 5 (December 1965), pp. 1077-96.

20. Harman, Harry J., *Modern Factor Analysis*, 2nd ed., rev. (Chicago: The University of Chicago Press, 1967).

21. Henderson, James M., "Local Government Expenditures: A Social Welfare Analysis," *The Review of Economics and Statistics*, Vol L, No. 2 (May 1968) 1956-63.

22. Krueger, Anne O., "The Economics of Discrimination," *Journal of Political Economy*, Vol. 71 (October 1963), pp. 481-86.

23. McKean, Roland N., *Efficiency in Government Through Systems Analysis* (New York: John Wiley and Sons, Inc., 1968).

24. Michelson, Stephan, "Incomes of Racial Minorities", unpublished manuscript (Washington: The Brookings Institution, February 1968).

25. Musgrave, Richard A., *The Theory of Public Finance* (New York: McGraw-Hill, 1959).

26. Olson, Mancur, Jr., "An Agenda for the Development of Measures of the Progress of a Racial or Ethnic Group," U.S. Department of Health, Education and Welfare (February 6, 1968), unpublished paper.

27. Report of the President's Commission on National Goals, *Goals for Americans* (Englewood Cliffs, N.J.: Prentice-Hall, 1960).

28. Rothenberg, Jerome, *The Measurement of Social Welfare* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1961).

29. Siegel, Paul M., "On the Cost of Being a Negro", *Sociological Inquiry* Vol. 35, No. 1 (Winter 1965), pp. 51-57.

30. U.S. Department of Commerce, Bureau of the Census, *U.S. Census of Population, 1960, United States Summary*, PC (1)-1C, Table 137.

31. *Statistical Abstract, op. cit.*, p. 753.

32. *Census of Governments, 1962, Compendium of Government Finances, op. cit.*, Table 37.

33. *Statistical Abstract, op. cit.*, p. 149. The "weighted index of crime rates" was calculated from the seven crime rate series published by the FBI–murder and nonnegligent manslaughter, forcible rape, robbery, aggravated assault, burglary, larceny, and auto theft. Each series was given equal weight.

34. U.S. Department of Commerce, Bureau of the Census, *County and City Data Book, 1962* (Washington, D.C.: U.S. Government Printing Office, 1962), Tables 3 and 6. This indicator contains two basic elements: first, the ratio of median family income in central cities to that for the SMSA, and second, the level of median family income in the central cities. Each element was weighted equally in determining the final ranking. All 130 cities with 1960 populations of 100,000 or more were included in the analysis and where the relevant SMSA extended into more than one state, the population was allocated to the relevant state. The ratio was weighted by the absolute level of income to reflect regional income differentials.

35. *Statistical Abstract, op. cit.*, p. 206.

36. "State Data and State Rankings in Health, Education, and Welfare," *op. cit.*, pp. S-2,4,5,6,13.

APPENDIX

THE SPECIFIC STATISTICS USED IN CONSTRUCTING EACH SOCIAL INDICATOR

I. THE STATUS OF THE INDIVIDUAL

A. Enhance Individual Dignity
- Level fo Public Assistance for:[1] (average monthly payments)
  - Old-age assistance
  - Aid to families with dependent children
- Social Security payments for:[1] (average monthly payments)
  - Retired
  - Disabled
- Living conditions index[2]

B. Promote Maximum Development of Individual Capabilities
- Quality of medical service index[3]
- Education index[4]

C. Widen Opportunities for Individual Choice
- Equality index[5]

II. INDIVIDUAL EQUALITY

Eliminate Discrimination on the Basis of Race, Sex, and Religion

A. Current Economic Status
- Ratio of nonwhite to white per capita median income adjusted for urban-rural differences in population distribution[6]
- Ratio of nonwhite to white employment rates[6]

B. Current Economic Discrimination
- Ratio of nonwhite to white income adjusted for occupation differences[6]

II. INDIVIDUAL EQUALITY (Continued)

- Ratio of nonwhite to white income adjusted for educational differences[6]

C. Socio-economic Impairment Discrimination
- Educational attainment as measured by the ratio of the white to nonwhite high school dropout rate[6]
- Educational attainment as measured by the ratio of nonwhite to white college graduate rate[6]
- Educational quality as measured by the ratio of white to nonwhite percent of draftees who failed the mental requirements portion of their pre-induction exams[7]
- Health
- Ratio of white to nonwhite age adjusted mortality rates[8]
- Environmental Conditions
- Urban housing density as measured by the ratio of white to nonwhite percent of occupied units with 1.01 or more persons per room[9]
- Quality of urban housing as measured by the ratio of nonwhite to white percent of occupied housing units which are sound and have all plumbing facilities[9]
- Segregation of urban housing as measured by a weighted index of the extent of segregation by census block[10]

III. EDUCATION

A. Output
- One minus the high school dropout rate[11]
- Percent passing pre-induction Army mental examination[12]
- Percent of population ages 5-20 enrolled in high school[13]
- First-time college enrollees as a percent of high school graduates[14]
- Percent of population ages 18-44 enrolled in higher education[15]
- First-time professional and graduate students as a percent of full-time undergraduates [24]

IV. ECONOMIC GROWTH

A. Output
- Percentage increase in personal income, 1960-65[16]
- Percentage increase in per capita personal income, 1960-65[16]

B. Input
- Per capita capital outlay by state and local governments[17]
- Unemployment rate[18]
- Living conditions index[2]
- Technological change index[19]
- Education index[4]

V. TECHNOLOGICAL CHANGE

A. Promotion and Encouragement of Technological Change
- Patents issued to residents of each state[20]
- Current expenditure on research in universities and colleges[21]
- Industrial research and development expenditures[22]

V. TECHNOLOGICAL CHANGE (Continued)

- Manpower[23]
- Number of scientists[24]
- NASA research contracts with universities and nonprofit organizations net subcontracts[25]
- Military prime contracts for research[25]
- AEC research contracts with universities and nonprofit organizations[23]

B. Education and Retraining
- Enrollment in vocational and technical eduation as percent of population[26]
- Per capita expenditure for vocational education[27]

VI. AGRICULTURE

A. Farm Level-of-Living Index[28]
- Average value of land and buildings per farm
- Average value of sales per farm
- Percent of farms with telephone
- Percent of farms with freezers
- Percent of farms with automobiles

VII. LIVING CONDITIONS

A. Remedy Slum and Poverty Conditions
- Total state technical assistance expenditure per poor person[29]
- Economic opportunity assistance expenditure per poor person[29]
- Percent of families with income under $3,000[30]
- Percent of sound housing units with plumbing facilities[31]

VII. LIVING CONDITIONS (Continued)

- B. Reverse the Process of Decay in Larger Cities
  - Per capita general expenditure of state and local governments for housing and urban renewal
  - Weighted index of crime rates
- C. Relieve the Necessity for Low-Income and Minority Groups to Concentrate in Central Cities
  - Weighted index of median family income in central cities as a percent of SMSA median family income
- D. Expand Parks and Recreation as Necessary to Meet Demand
  - Per capita recreation area

VIII. HEALTH AND WELFARE

- A. Medical Care
  - Number of doctors per 100,000 population
  - Number of dentists per 100,000 population
  - Number of nurses per 100,000 population
  - Number of acceptable general hospital beds per 1,000 population
  - Number of acceptable mental hospital beds per 1,000 population

VIII. HEALTH AND WELFARE (Continued)

  - Number of beds for long-term care for aged per 1,000 population
  - Special and general patient days of care per 1,000 population
  - Mental patient days of care per 1,000 population
  - State and county mental hospital admissions per 100,000 population
  - State and county mental hospital releases per 1,000 average daily patients
  - Percent population served by fluorinated water supply
  - Infant deaths per 1,000 live births
- B. Welfare
  - Child health and welfare
  - Child welfare expenditure per child under 21
  - Mothers receiving medical clinic services
  - Crippled children served
  - Children receiving child welfare services
  - Full-time caseworkers per 10,000 children
  - Vocational rehabilitation
  - Rehabilitants per 100,000 population
  - Cases per counselor
  - Per capita expenditures
  - Public assistance
  - Old age assistance
  - Aid to families with dependent children

REFERENCES TO APPENDIX

1. U.S. Department of Health, Education, and Welfare, Office of the Assistant Secretary for Program Coordination, "State Data and State Rankings in Health, Education, and Welfare" (Washington, D.C.: U.S. Government Printing Office, 1965), p. S-6.
2. The ranking contained in Goal VII.
3. The ranking contained in Goal VIII under the medical care category.
4. The ranking contained in Goal III.
5. The ranking contained in Goal II.
6. U.S. Department of Commerce, Bureau of the Census, *Characteristics of the Population, Detailed Characteristics, Individual States*, 1960.
7. Unpublished data obtained from the Medical Statistics Agency, Office of the Surgeon General, Department of the Navy.
8. U.S. Department of Health, Education, and Welfare, Public Health Service, National Vital Statistics Division, *Vital Statistics of the United States, 1960, Volume II - Mortality Part B*, and Forrest E. Linder, and Robert D. Grove, Techniques of Vital Statistics (Washington: U.S. Department of Health, Education, and Welfare, June 1959).
9. U.S. Department of Commerce, Bureau of the Census, *Census of Housing, States and Small Areas, 1960*, and "Measuring the Quality of Housing, An Appriasal of Statistics and Methods", working paper No. 25, 1967.
10. K.E. Taeuber, and A.F. Taeuber, *Negroes in Cities*, (Chicago, Aldine Publishing Company, 1965).
11. Department of Health, Education, and Welfare, Office of Education, *A State Profile on School Dropouts, Juvenile Delinquents, Unemployed Youth, and Related Federal Programs, Fiscal Year 1966.*
12. *Statistical Abstract.*
13. *Ibid.*, and Department of Commerce, Bureau of the Census, *Current Population Estimates*, "Estimates of the Population of States, by Age, 1960 to 1966", Series P-25; No. 384, February 13, 1968.
14. Department of Health, Education, and Welfare, Office of Education, *Residence and Migration of College Students, Fall 1963* (OE-54033, Circular Number 783).

15. *Ibid.*, and Department of Health, Education, and Welfare, Office of Education, *Resident and Extension Enrollment in Institutions of Higher Education, Fall 1963* (OE-5400, Circular number 776).

16. *Statistical Abstract, op. cit.*, p. 330.

17. U.S. Department of Commerce, Bureau of the Census, *Census of Governments, 1962, Compendium of Government Finances*, Vol. IV, No. 4, p. 56.

18. U.S. Department of Labor, "Manpower Report of the President", March 1966, p. 208.

19. The ranking contained in Goal V.

20. U.S. Commissioner of Patents, "Annual Report, Fiscal Year 1966," (Washington, D.C.: U.S. Government Printing Office), pp. 28-29.

21. National Science Foundation, "Reviews of Data on Science Resources," NSF 66-27, No. 9, August, 1966, p. 14.

22. National Science Foundation, "Basic Research, Applied Research, and Development in Industry, 1964," NSF 66-28, p. 35.

23. U.S. House of Representatives, 88th Congress, "Hearings Before the Subcommittee on Manned Space Flight of the Committee on Science and Astronautics" (Washington, D.C.: U.S. Government Printing Office, 1963), p. 170 and pp. 720-23.

24. National Science Foundation, "Reviews of Data on Science Resources," NSF 66-34, No. 11, December 1966, p. 3.

25. D.A. Murry, "Scientific Research in Missouri" (Columbia, Missouri: Research Center, School of Business and Public Administration, University of Missouri, 1965), pp. 44-47.

26. "State Data and State Rankings in Health, Education, and Welfare," *op. cit.*, p. S-3 and p. S-42.

27. U.S. Department of Health, Education, and Welfare, "Vocational and Technical Education, 1964" (Washington, D.C.: U.S. Government Printing Office, 1965), Tables 1 and 5.

28. U.S. Department of Agriculture, Economic Research Service, "Farm Operator Level of Living Index for Counties of the United States, 1950 and 1959," pp. 29-30.

29. Advisory Commission on Intergovernmental Relations, "Intergovernmental Relations in the Poverty Program" (Washington, D.C.: April 1966), Tables B-8 and B-9.

COMPARISON OF *QOL* FACTOR LISTS

The following table was developed by Ken Hornback, member of the EPA Summer Fellows Research Program conducted in 1972 and Dr. Robert W. Shaw, Jr. of Booz-Allen Applied Research. The *QOL* factor lists suggested by various authors are compared to that developed by the EPA Fellows. The horizontal structure in the table is intended to emphasize similarities between the lists. The table is excerpted from a report entitled *A Quantitative Measure of the Quality of Life* researched and written by Hornback and Shaw.

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COMPARISON OF QOL FACTOR LISTS[1]

EPA FELLOWS (1972)	PERLOFF (1969)	MOSS (1968) (IN SHELDON & MOORE, pp 504 5)	COMMUNITY AND ENVIRONMENT ASSESSMENT COMMITTEE (1972)	DALKEY & ROURKE (1971) p. 12	REPORT OF THE WHITE HOUSE CONFERENCE ON YOUTH INDIVIDUALISM (1971)	GROSS & SPRINGER (1967) pp 4 5	WILSON
			PERSON DISSATISFACTION PAST LIFE EVENTS EXPECTED LIFE EVENTS DEMOGRAPHIC VARIABLES (AGE RACE SEX) LABOR FORCE & COMMUNITY PARTICIPATION STATUS EXPECTATION ORGANIZATIONAL **HOUSEHOLD** (3) STATUS INCONGRUITY SOCIAL STATUS INDEX LIFE CYCLE TYPOLOGY DISPOSABLE INCOME TOTAL CONSUMPTION OF GOODS & SERVICES WEALTH	**PSYCHOLOGICAL ASPECTS** FEAR/ANXIETY AGGRESSION AMBITION COMPETITION DOMINANCE/SUPERIORITY ACQUISITIVENESS COMFORT NOVELTY ETC	**INDIVIDUALISM**	**INDIVIDUAL AND GROUP VALUES** INTENSITY OF COMMITMENT TO PARTICULAR VALUES AND BELIEFS	**INDIVIDUAL**
ECONOMIC ENVIRONMENT WORK SATISFACTION INCOME INCOME DISTRIBUTION ECONOMIC SECURITY	**WORK PLACES** SAFETY AMENITIES WORK CHALLENGE	**WELFARE BENEFITS** PUBLIC ASSISTANCE AND RELIEF UNEMPLOYMENT OLD AGE AND RETIREMENT DISABILITY AND PENSION ALLOWANCES	**ECONOMIC** BUSINESS INDICATORS NEIGHBORHOOD MEDIAN INCOME ASSENTEEISM TURNOVER RETAIL SALES COST OF LIVING UNEMPLOYMENT		**INCOME & ECONOMIC SECURITY** **AGGREGATE ECONOMIC ADVANCEMENT** **PRODUCTIVE EMPLOYMENT AREAS** **EMPLOYMENT AND PRODUCTIVITY**		**ECONOMIC** **WELFARE** (2)
POLITICAL ENVIRONMENT INFORMED CONSTITUENCY CIVIL LIBERTIES ELECTORAL PARTICIPATION NON ELECTORAL PARTICIPATION GOVERNMENT RESPONSIVENESS			**POLITICAL/GOVERNMENTAL** ISSUENESS OF MATTERS OF GOVERNMENT OPENNESS TO POWER RESPONSIVENESS TO PUBLIC		**JUSTICE FREEDOM** **LIVING ENVIRONMENT**	**DISCRIMINATION AGAINST NEGROES** **CIVIL LIBERTIES** **THE MASS MEDIA** (APPRAISALS OF DEPTH REPORTING) **ELECTORAL PARTICIPATION**	**INDIVIDUAL** **STATE AND** INFORMED A CITIZENRY PROFESSION
PHYSICAL ENVIRONMENT HOUSING TRANSPORTATION MATERIAL QUALITY PUBLIC SERVICES AESTHETICS	**HOUSEHOLD SHELTER** HOUSING CONDITION CROWDING RATS, ROACHES, OTHER PESTS PLUMBING HOUSEHOLD EQUIPMENT **TRANSPORTATION UTILITIES** TRANSPORTATION WATER SUPPLY SEWERAGE SOLID WASTE DISPOSAL ELECTRICITY GAS TELEPHONE OTHER COMMUNICATION	**HOUSING, ENVIRONMENT (4) & UTILITIES** HOUSING (URBAN RENEWAL, PUBLIC HOUSING) PHYSICAL ENVIRONMENT (HIGHWAYS, WATER, UTILITIES)	**HOUSING** TYPE RESIDENTIAL STABILITY DENSITY AVAILABILITY				**TECHNOLO** **LIVING CON** (E.G. ALLEVI POVERTY)
SOCIAL ENVIRONMENT COMMUNITY SOCIAL STABILITY CULTURE PHYSICAL SECURITY FAMILY SOCIALIZATION RECREATION	**COMMUNITY NEIGHBORHOOD** COMMUNITY CHARACTERISTICS SERVICES ENVIRONMENT	**REGULATION & SAFETY** **RECREATION & CULTURE** **NATIONAL DEFENSE** **HUMAN RESOURCE DEVELOPMENT** EDUCATION HEALTH	**SOCIAL/CULTURAL** SOCIAL DISORDER VALUE CONSENSUS SOCIAL INVOLVEMENT COMMUNICATIONS		**GENERAL HEALTH** **TRAINING, EDUCATION AND CULTURE**	**CRIME AND DELINQUENCY**	**EDUCATION**
HEALTH PHYSICAL MENTAL NOURISHMENT			**POPULATION** BIRTH RATE DEATH RATE				**HEALTH** (2)
NATURAL ENVIRONMENT AIR QUALITY WATER QUALITY RADIATION SOLID WASTE TOXICITY NOISE	**SPATIAL ENVIRONMENT** UNDERGROUND SPACE UNCOVERED LAND COVERED LAND RADIOSPECTRUM SPACE AIRWAYS SPACE **NATURAL ENVIRONMENT** OPEN SPACE RECREATION AIRSHED WATERSHED QUIET AND NOISE ZONES MICRO-CLIMATE ZONES SUNLIGHT EXPOSURE OLFACTORY ZONE	**HOUSING, ENVIRONMENT (4) & UTILITIES** AIR CONSERVATION DEVELOPMENT OF RESOURCES	**NATURAL ENVIRONMENT** POLLUTION METEROLOGICAL VARIABLES NATURAL RESOURCE AVAILABILITY		**NATURAL ENVIRONMENT**	**NATURAL ENVIRONMENT** STREAMS ESTUARIES LAKES AIR ABOVE METRO AREAS SOLID WASTES	
		SPACE **GENERAL GOVERNMENT** GENERAL GOVERNMENT INTERNATIONAL AFFAIRS & FINANCE	**POLITICAL/GOVERNMENTAL** GOVERNMENT FISCAL ACTIVITY **GENERAL SERVICES** SUPPLY DEMAND UTILIZATION **POPULATION** MIGRATION			**URBAN CONDITIONS** INTERNAL MIGRATION EMPLOYMENT DATA SEGREGATION DATA	**AGRICULTU**

FOOTNOTES:

1. THE 10 "SOCIAL GOALS CATEGORIES" OF DR. N.E. TERLECKYJ (1972) ARE NOT INCLUDED IN THIS CHART. TERLECKYJ'S LIST, WHILE CORRESPONDING CLOSELY TO THE EPA "FACTORS" CAME TO OUR ATTENTION WHEN THE FINAL DRAFT OF THIS MANUSCRIPT WAS BEING PREPARED.

2. "HEALTH" AND "WELFARE" WERE CLASSIFIED BY WILSON TOGETHER AS "HEALTH AND WELFARE". THEY HAVE BEEN SEPARATED TO PARALLEL THE EPA LIST.

3. THE "HOUSEHOLD" CATEGORY OF THE CEAC MEETING INCLUDES ELEMENTS TH EPA "ECONOMIC ENVIRONMENT" SECTOR AND OTHERS THAT PARALLEL NO FA FELLOWS LIST. THIS FACT IS INDICATED BY THE POSITIONING OF THE "HOUSEHOLD TABLE.

A

EXHIBIT A
Comparison of QOL Factor Lists

COMPARISON OF QOL FACTOR LISTS[1]

TY AND ENVIRON SSMENT TEE (1972)	DALKEY & ROURKE (1971) p. 12	REPORT OF THE WHITE HOUSE CONFERENCE ON YOUTH (INDIVIDUALISM) (1971)	GROSS & SPRINGER (1967) pp. 4-5	WILSON (1972) pp. 1-4	SAN DIEGO ENVIRONMENTAL DEVELOPMENT AGENCY (1972) p. 53	FLAX (1978) p. 9	OFFICE OF MANAGEMENT & BUDGET (1972)
ECTION EVENTS LIFE EVENTS IC VARIABLES (AGE) S & COMMUNITY ATION ECTATION IONAL (3) NGRUITY TUS INDEX TYPOLOGY INCOME MPTION OF GOODS &	PSYCHOLOGICAL ASPECTS FEAR ANXIETY AGGRESSION AMBITION COMPETITION DOMINANCE/SUPERIORITY ACQUISITIVENESS COMFORT NOVELTY ETC.	INDIVIDUALISM	INDIVIDUAL AND GROUP VALUES INTENSITY OF COMMITMENT TO PARTICULAR VALUES AND BELIEFS	INDIVIDUAL STATUS			
ICATORS D MEDIAN INCOME ES ING ENT		INCOME & ECONOMIC SECURITY AGGREGATE ECONOMIC ADVANCEMENT PRODUCTIVE EMPLOYMENT AREAS EMPLOYMENT AND PRODUCTIVITY		ECONOMIC GROWTH WELFARE (2)		INCOME UNEMPLOYMENT POVERTY	EMPLOYMENT WORK ENVIRONMENT AND JOB SATISFACTION EMPLOYMENT OPPORTUNITY INCOME LOW INCOME POPULATION INCOME DISTRIBUTION LEVEL OF PERSONAL INCOME
GOVERNMENTAL F MATTERS OF ENT D POWER SS TO PUBLIC		JUSTICE FREEDOM LIVING ENVIRONMENT	DISCRIMINATION AGAINST NEGROES CIVIL LIBERTIES THE MASS MEDIA APPRAISAL OF DEPTH REPORTING ELECTORAL PARTICIPATION	INDIVIDUAL EQUALITY STATE AND LOCAL GOVERNMENT INFORMED AND INVOLVED CITIZENRY PROFESSIONALISM		RACIAL EQUALITY COMMUNITY CONCERN CITIZEN PARTICIPATION	
L STABILITY TY				TECHNOLOGICAL CHANGE LIVING CONDITIONS (E.G. ALLEVIATING GENERAL POVERTY)		HOUSING TRANSPORTATION	HOUSING AND PHYSICAL ENVIRONMENT HOUSING AND QUALITY OF LIVING CONDITIONS NEIGHBORHOOD QUALITY ENVIRONMENTAL QUALITY
[illegible]		GENERAL HEALTH TRAINING EDUCATION AND CULTURE	CRIME AND DELINQUENCY	EDUCATION	SOCIAL-AESTHETIC HOUSING ADEQUACY VISUAL AND AESTHETIC CHARACTERISTICS PESTS	PUBLIC ORDER EDUCATIONAL ATTAINMENT SOCIAL DISINTEGRATION	EDUCATION BASIC SKILLS FOR EVERYONE OPPORTUNITY FOR ADVANCED LEARNING LEISURE AND RECREATION TIME AVAILABLE PARTICIPATION PUBLIC SAFETY/LEGAL JUSTICE SAFETY OF LIFE AND PROPERTY FROM CRIME EQUITABLE CRIMINAL JUSTICE
				HEALTH(2)		HEALTH MENTAL HEALTH	HEALTH LONG LIFE PHYSICAL AND MENTAL WELL BEING
ONMENT L VARIABLES URCE TY		NATURAL ENVIRONMENT	NATURAL ENVIRONMENT STREAMS ESTUARIES LAKES AIR ABOVE METRO AREAS SOLID WASTES		AIR AND WATER RELATED AIR QUALITY WATER QUALITY NOISE MULTI MEDIA RELATED HAZARDOUS SUBSTANCES SOLID WASTE	AIR QUALITY	
NMENTAL ICAL ACTIVITY NG			URBAN CONDITIONS INTERNAL MIGRATION EMPLOYMENT DATA SEGREGATION DATA	AGRICULTURE	LAND RELATED LAND USE/LAND USE SHIFT RECREATIONAL RESOURCES WILDLIFE & NATURAL VEGETATION NATURAL RESOURCE DEPLETION		POPULATION POPULATION LIVING ARRANGEMENTS FAMILY STRUCTURE

LFARE" WERE CLASSIFIED BY WILSON TOGETHER AS "HEALTH AND WELFARE" ATED TO PARALLEL THE EPA LIST.

3. THE "HOUSEHOLD" CATEGORY OF THE CEAC MEETING INCLUDES ELEMENTS THAT PARALLEL THE EPA "ECONOMIC ENVIRONMENT" SECTOR AND OTHERS THAT PARALLEL NO FACTORS IN THE EPA FELLOWS LIST. THIS FACT IS INDICATED BY THE POSITIONING OF THE "HOUSEHOLD" CATEGORY IN THE TABLE.

4. MOSS CATEGORY "HOUSING ENVIRONMENT AND UTILITIES" HAS BEEN SPLIT INTO TWO PARTS TO PARALLEL THE EPA FELLOWS LIST OF FACTORS.

VII REFERENCES

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REFERENCES

Ayres, Robert U. and Kneese, Allan V., "Production, Consumption and Externalities," *American Economics Review*, June 1969.

Ayres, Robert U., "A Material-Process-Product Mode," in Allan V. Kneese and Blair T. Bower ed. *Environmental Quality Analysis*, (Baltimore: Johns Hopkins Press for Resources for the Future, Inc. 1972).

Bales, Robert F. and Arthur S. Couch, "The Value Profile: A Factor Analytic Study of Value Statements," *Sociological Inquiry*, Winter 1968.

Bauer, Raymond A., ed., *Social Indicators*, The M.I.T. Press, 1966.

Biderman, Albert D. *Social Indicators—Whence and Whither*. A paper presented to First Annual Social Indicators Conference. American Marketing Association, Feb. 17-18, 1972.

Bradburn, Norman and David Capolvitz, *Reports on Happiness: A Pilot Study of Behavior Related to Mental Health*, Aldine, 1965.

Brandes, Ely M., "Normative, NVB-Based Futures," unpublished memorandum, Educational Policy Research Center, December 1969.

Bugental, J. F. T., "Notes on Graves's Levels of Existence Conception," Educational Policy Research Center internal memorandum, August 20, 1969.

Cain, Stanley A., *Conservation: The Developing Ecological Science of Resource Management*, Second National Congress on Environmental Health, Proceedings, 1961.

Campbell, Angus and Philip Converse, *The Human Meaning of Social Change*. New York: Russell Sage Foundation, 1972.

Cantril, Hadley, *The Pattern of Human Concern*, Rutger's University Press, 1966.

Center for Urban Studies, Wayne State University, *Social Reporting in Michigan: Problems and Issues*, (Lansing, Michigan: Office of Planning Coordination, Bureau of Policies and Programs, 1970).

Commission on Population Growth and the American Future. *Population and the American Future*, 1972.

Preceding page blank

Corning, Pater A. *An Index for the Quality of Life*. Paper presented at the 138th meeting of the American Association for the Advancement of Science. December 1971.

Dalkey, Norman C., Ralph Lewis, and David Snyder, "Measurement and Analysis of the *Quality of Life*," prepared for U.S. Department of Transportation, Rand, August 1970.

Dalkey, Norman C., Studies in the *Quality of Life*–Delphi & Decision-making, D.C. Heath & Co., Lexington, Mass., Rand, 1972.

Denison, Edward F., "Welfare Measurement and The GNP," *Survey of Current Business*, Vol. 51, No. 1, January 1971.

Drewnowski, Jan, and Wolf Scott, "The Level of Living Index," Report No. 4, United Nations Research Institute for Social Development, Geneva, September 1966.

Duncan, Otis Dudley, *Toward Social Reporting: Next Steps*. New York: Russell Sage Foundation, 1969.

Fisher, Joseph L. "The Natural Environment" *The Annals of the American Academy of Political and Social Science*, May 1967.

Forrester, Jay W., *World Dynamics*, Wright-Allen Press, 1971.

Goals for Americans, President's Commission on National Goals, Spectrum Books, 1962.

Goldberg, M.A. and Holling, C.S., *The Vancouver Regional Simulation Study, 1970-71*, Resource Science Center, the University of British Columbia, Vancouver, Canada.

Graves, Clare W., "On the Theory of Value," mimeographed paper, March 1967.

Graves, Clare W., W. I. Huntley, and Douglas W. LaBier, "Personality Structure and Perceptual Readiness: An Investigation of their Relationship to Hypothesized Levels of Human Existence," mimeographed paper, May 1965.

Gray, James N., "A Critique of Forrester's Model of An Urban Area," *IEEE Transactions on Systems, Man, and Cybernetics*, Vol., SMC-2, No. 2, April 1972.

Gross, Bertram M., "The City of Man: A Social Systems Accounting," in *Environment for Man*, William R. Ewald, Jr., ed., Indiana University Press, 1967.

Gross, Bertram M., "The New Systems Budgeting," *Public Administration Review*, March-April 1969.

Gross, Bertram M., ed., "Social Goals and Indicators for American Society," *The Annals*, American Academy of Political and Social Science, volumes 371 and 372, May and September 1967.

Gross, Bertram M., *The State of the Nation: Social System Accounting*, Tavistock Publications, London, 1966.

Gross, Bertram, *Social Intelligence for America's Future*. New Jersey: Allynn and Bacon, Inc., 1969.

Hammond, Richard J. and Ernest C. Harvey, "Some Tentative Observations on Social Indicators," SRI IR&D Report, June 1970.

Harman, Willis W., "Belief Systems, Scientific Findings and Educational Policy," Educational Policy Research Center Research Note 6747-4, November 1967.

Harvey, O. J., David E. Hunt, and Harold M. Schroder, *Conceptual Systems and Personality Organization*, John Wiley and Sons, 1961.

Huddle, Franklin P. *The Evolution and Dynamics of National Goals in the United States*. Congressional Research Service: Washington, D.C., 1971.

Inglehart, Ronald. "The Silent Revolution in Europe: Intergenerational Change in Post-Industrial Societies," to appear in the fall, 1971 issue of *The American Political Science Review*.

Isard, Walter et al, *Ecologic-Economic Analysis for Regional Development*, (New York: The Free Press, 1972).

James, Dorothy Buckton, "Poverty, American Values and Change," delivered at Annual Meeting of the American Political Science Association Los Angeles, September 1970.

Jones, Martin V. and Michael J. Flax, *The Quality of Life in Metropolitan Washington, D.C:–Some Statistical Benchmarks*. The Urban Institute, Washington, D.C., March 1970.

Joun, Young P., "Information Requirements for Socio-Ecological Models," *The Annals of Regional Science*, Vol. V, No. 1, June 1971.

Joyce, Robert E. "Systematic Measurement of the Quality of Urban Life, Prerequisite to Management," from *Seminar on Management of the City*. Research Analysis Corporation, May 1971, pp. 69-86.

Kamrany, Nake M. and Alexander N. Christakis, *Social Indicators in Perspective*, International Seminar on Ekistics and the Future of Human Settlements, July 1969.

Kantor, Robert E., "Psychological Theories and Social Groupings," Educational Policy Research Center Research Memorandum 6747-5, SRI, November 1969.

Kluckholm, Florence R. and F. L. Strodtbeck, *Variations in Value Orientations*, Row, Peterson, 1961.

Kohlberg, Lawrence, *Stages in the Development of Moral Thought and Action*, Holt, Rinehart, & Winston 1970.

Krieger, Martin H., "Social Indicators for the Quality of Individual Life," Center for Planning and Development Research, University of California, Berkeley, Working Paper 104, October 1969.

Logothetti, Thomas J., "Social Measurements Handbook," compiled for SRI, 1970.

Maslow, A. H., *Motivation and Personality*, Harper, 1954.

Maslow, A. H., *Religions, Values, and Peak-Experiences*, Ohio State University Press, 1964.

Maslow, A. H., *Toward a Psychology of Being*, 2nd ed., Van Nostrand, 1968.

Meadow, Donella H. et al, *The Limits to Growth*, (New York: University Books, 1972).

Mitchell, Arnold, "Alternative Futures: An Exploration of a Humanistic Approach to Social Forecasting," Educational Policy Research Center Research Note 6747-2, SRI, November 1967.

Mitchell, Arnold, "Note on Personality Change," internal memorandum, Educational Policy Research Center, September 1969.

Mitchell, Arnold and Mary K. Baird, "American Values," Long Range Planning Service report No. 378, SRI, June 1969.

National Wildlife Federation, National Environmental Quality Index, *National Wildlife*, Aug.-Sept., 1969.

National Wildlife Federation, 1970 National Environmental Quality Index, *National Wildlife*, Oct.-Nov., 1970.

National Wildlife Federation, 1971 National Environmental Quality Index, *National Wildlife*, Oct.-Nov., 1971.

National Wildlife Federation, 1971, EQ Index Reference Guide, Washington, D.C.

Perloff, Harvey S., "A Framework for Dealing with the Urban Environment: Introductory Statement," in Harvey S. Perloff, ed. *The Quality of the Urban Environment*, (Baltimore: Johns Hopkins Press, 1968).

Peterson, Richard, *On a Typology of College Students*, 1965.

Roberts, Thomas B., "Toward a Humanistic Social Science: A Consciousness Theory Outlined and Applied," *Journal of Human Relations*, Fourth Quarter 1970.

Rokeach, Milton and Seymour Parker, "Values as Social Indicators of Poverty and Race Relations in America," *The Annals of the Academy of Political and Social Science*, March 1970.

Rokeach, Milton, "The Role of Values in Public Opinion Research," *Public Opinion Quarterly*, Winter 1968-1969.

Russell, Clifford S. and Spofford, Walter O., Jr., "A Quantitative Framework for Residual Management Decision," in Allen V. Kneese and Blair T. Bower ed., *Environmental Quality Analysis: Theory and Method in the Social Sciences*, (Baltimore: The Johns Hopkins Press for Resources for the Future, Inc., 1972).

Sheldon, Bernert Eleanor and Howard E. Freeman, "Notes on Social Indicators: Promises and Potential," *Policy Sciences 1*, 1970.

Sheldon, Bernert Eleanor and Wilbert E. Moore, eds. *Indicators of Social Change: Concepts and Measurements*, Russell Sage Foundation, New York 1968.

"Social Reporting in Michigan: Problems and Issues," Center for Urban Studies, Wayne State University, Technical Report A-37, January 1970.

Springer, Michael, "Social Indicators, Social Reports, and Social Accounts," Operation PEP, San Mateo County Board of Education, March 1970.

The Gallup Organization, Inc., The U.S. Public Considers Its Environment (conducted for the National Wildlife Federation). Princeton, New Jersey, 1969.

Toward Balanced Growth: Quantity with Quality, National Goals Staff, Washington, D.C., July 1970.

Toward a Social Report, U.S. Department of Health, Education, and Welfare, GPO, 1969. This is the so-called "Olson report" because it was prepared under the direction of Mancur Olson.

"Toward Master Social Indicators," Educational Policy Research Center Research Memorandum 6747-2, SRI, February 1969.

Trow, Martin, "Student Cultures and Administrative Action," 1962.

Trow, Martin and Burton Clark, "The Organizational Context," 1966.

U.S. Department of Health, Education, and Welfare. *Toward a Social Report*. U.S. Government Printing Office: Washington, D.C., January 1969.

Vestermark, S. D., Jr., ed., "Indicators of Social Vulnerability," Human Sciences Research, Inc., McLean, Virginia, August 1968.

Watt, Kenneth, et al, *A Model of Society*, Environmental Systems Group, Institute of Ecology, University of California, Davis, 1969.

Wilson, John Q., *Quality of Life in the United States - An Excursion into the New Frontier of Socio-Economic Indicators*, (Kansas City: Midwest Research Institute, 1969).

Wilson, John O., "Regional Differences in Social Welfare," draft, Midwest Research Institute, Kansas City, August 1967.